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**COMPENSATION
FOR VICTIMS OF
DISASTERS IN
BELGIUM, FRANCE,
GERMANY AND
THE NETHERLANDS**

*Compensation for Victims of Disasters in Belgium,
France, Germany and the Netherlands*

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All publications of the The Netherlands Scientific Council for Government Policy (WRR) are available at www.wrr.nl.

Cover and paper design: Textcetera, The Hague

Layout: Textcetera, The Hague

Working Paper number 30

ISBN 978-94-90186-71-5

NUR 741

WRR, The Hague 2018

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LIST OF ABBREVIATIONS

- AMINAL – Administration for Environment, Nature, Land and Water Management (Flemish Region in Belgium)
- CCR – Caisse Centrale de Réassurance (France)
- CFA – Commissie Financiële Afwikkeling Vuurwerkkramp
- CSC – Convention on Supplementary Compensation for Nuclear Damage
- CTRC – Commissie Tegemoetkoming bij Rampen en Calamiteiten (Commission for Compensation in cases of catastrophes and incidents)
- FFSA – French Federation of Insurance Corporations
- FGTI – Fonds de garantie des victimes des actes de terrorisme et d’autres infractions
- GAREAT – Gestion de l’Assurance et de la Réassurance des Risques Attentats et Actes de Terrorisme (Reinsurance Pool for Terrorism Risks)
- GEMA – French Grouping of the Mutual Insurance Companies
- GENTG – Gentechnikgesetz (Germany)
- GNP – Gross National Product
- IAEA – International Atomic Energy Agency
- IPCC – Intergovernmental Panel on Climate Change
- LuftVG – Luftverkehrsgesetz (Germany)
- NEA – Nuclear Energy Agency
- NHT – Nederlandse Herverzekeringsmaatschappij voor Terrorismeschade (Netherlands reinsurance company for terrorism risk)
- NRF – Stichting Nationaal Rampenfonds
- OECD – Organization for Economic Cooperation and Development
- SDR – Special Drawing Rights
- STVG – Strassenverkehrsgesetz (Germany)
- TRIP – Terrorism Risk Insurance Pool (Belgium)
- UmweltHG – Umwelthaftungsgesetz (Germany)
- USD – United States Dollar
- WRR – Wetenschappelijke Raad voor het Regeringsbeleid (Netherlands Scientific Council for Government Policy)
- WTS – Wet Tegemoetkoming Schade bij Rampen en Zware Ongevallen

PREFACE

The Netherlands Scientific Council for Government Policy (Wetenschappelijke Raad voor het Regeringsbeleid, WRR) has launched a project on digital disruption. Within this project, an important question is whether the Netherlands is prepared for the large-scale disruption and/or failure of digital infrastructure and everything that is now linked to it. An important element in the preparation for emergencies and disasters are statutory regulations for the financial compensation of victims. According to the authors of this study, such regulations not only contribute to the ability of citizens and businesses to recover quickly after a disaster, but they can also have a preventive effect if they have been carefully defined.

In *Compensation for Victims of Disasters in Belgium, France, Germany and the Netherlands*, Véronique Bruggeman and Michael Faure evaluate financial compensation for victims of natural and industrial disasters in the Netherlands, Belgium, Germany and France. Although disasters have always taken place, the way that they are handled differs between countries. Whereas some countries have structural statutory regulations in place for the financial compensation of victims, others work with ad hoc provisions. A previous international comparison in 2006 showed that the situation in the Netherlands was falling behind that within other countries in a number of areas. Bruggeman and Faure are investigating to what extent this situation has now changed.

While the authors mainly focus on natural and industrial disasters, they are also looking ahead to how a digital disaster might be handled. Society's growing dependence on digital technology means that its disruption and/or failure can indeed result in increasingly far-reaching consequences and perhaps even fatalities. *Compensation for Victims of Disasters in Belgium, France, Germany and the Netherlands* therefore offers insight into the international position of the Netherlands in terms of dealing with victims and provides key building blocks for the WRR project on the preparation for digital disruption.

I INTRODUCTION

In the recent decade, a lot of attention has been paid to the way in which victims of a variety of disasters are financially compensated. Many legislators have been active by creating specific compensation mechanisms – although, in some countries, compensation is not based on a structural statutory framework but will rather be provided *ad hoc* if politicians consider the particular disaster to deserve *ex post* compensation. Various studies have also shown that there are remarkable differences with respect to financial compensations for victims of disasters, even between European countries. Despite the existence of a European Solidarity Fund, this is a domain which has not been subject to any harmonization, and differences between the European Member States, therefore, remain large.

The importance of adequate financial compensation for victims of disasters has been stressed in various streams of literature. Some have pointed at the fact that disasters can have a disruptive effect on societies, and that providing adequate financial compensation for victims, therefore, is considered an important condition for restoring social stability after a disaster. Other literature, dealing with economic approaches to law, for example, has also pointed at the relationship between *ex post* compensation, on the one hand, and *ex ante* prevention, on the other. This literature stresses the fact that particular *ex post* compensation mechanisms, more particularly *ad hoc* compensation provided by the government, may have negative effects on the victims' *ex ante* incentives to invest in prevention. A careful institutional design of the *ex post* compensation mechanisms, therefore, is of importance not only to restore social stability after a disaster, but also to add to disaster risk reduction.

It is against this background that we have analysed financial compensation mechanisms in four countries from a comparative perspective. From the outset, it should be made clear that disasters can lead to a variety of losses, pecuniary losses (such as income loss, property loss etc.), but also non-pecuniary losses. Remedies could also either be of a financial nature (financial compensation) or of a non-monetary nature (restoration in kind, excuses or other types of relief, for example). For reasons of simplicity, we will not distinguish between different heads of damages in this study, and we will focus on financial compensation for victims of catastrophes.

Our point of reference with respect to financial compensation will be the Netherlands. The reason for this focus on the Netherlands is that various studies have shown that the financial compensation mechanism in this country shows a particular gap, a shortage as far as adequate compensation of disaster victims is concerned. We want to examine, therefore, whether the financial compensation

framework in the Netherlands has particular gaps when compared with neighbouring countries Belgium, France and Germany. The reason for our focus on Belgium, France and Germany is not only that they are close to the Netherlands and, with the exception of France, even direct neighbours, but also that legislative changes have taken place in Belgium and France towards a more structural financial compensation mechanism for disaster victims, whereas a debate on a more structural financial compensation has taken place in Germany, which has, however, not yet led to any legislative changes.

We will start by giving an overview of the financial compensation regimes in Belgium, France and Germany and then discuss the situation in the Netherlands, more particularly to indicate where the Dutch compensation regime shows a particular gap. We will identify whether there is a particular statutory structural solution, thus distinguishing between insurance-based solutions and other ones. This discussion of the systems in Belgium, France and Germany will be used to indicate how the Netherlands could learn from examples abroad and to some extent to show that, in some countries such as Germany, problems may arise that are similar to those in the Netherlands.

As far as the scope of the research is concerned, we will focus on four types of disasters. The first type of disaster we focus on is natural disasters such as flooding, hurricanes and earthquakes. The second category is technological or man-made disasters, such as an explosion in a chemical factory causing large-scale damages. The distinction between the two types of disasters is important as a liable injurer can usually be identified in the second case, as a result of which liability rules and liability insurance could be applied, whereas this is not necessarily the case with natural disasters. However, some literature has pointed at the fact that the boundaries between natural and man-made disasters are becoming increasingly blurred: some natural events, after all, turn into disasters as a result of human intervention. From a legal perspective, however, this does not always allow liability rules to be applied to natural disasters. In fact, the only party that could be subject to liability rules in the case of natural disasters would be the government, and many legal systems still have high thresholds or immunities for public authority liability.

In addition to a general discussion of natural and technological disasters, we will also briefly focus on two specific types of disasters: nuclear accidents and terrorism. Our analysis of nuclear accidents will be relatively brief as all four countries are signatories to the financial compensation framework for victims of nuclear accidents created through the Convention on third party liability in the field of nuclear energy of 29 July 1960 (known as the Paris Convention) and related international treaties. There are differences, however, in the way in which these conventions have been implemented in the four countries and in the compensation amounts they award. It is interesting to address the different ways in which the

international conventions have been implemented, as will be shown, as some differences are striking, and some countries (Germany) have unlimited liability in combination with a risk-sharing agreement by nuclear operators, which may be an interesting model for other disasters. After 9/11, specific arrangements have also been created in the four countries under discussion to insure terrorism-related damage. A brief discussion of these mechanisms is very interesting, showing that relatively high amounts of compensation can be provided through a so-called public-private partnership, whereby the government intervenes as reinsurer of last resort via a pool construction.

In addition to these four specific types of disasters, one could of course easily imagine other types of catastrophes that could also present a potential disruption of society, such as a large food poisoning outbreak or cyber security risks. These, however, will not be addressed within the scope of this study. A major difference between cyber risks and the other man-made disasters that we discuss within the scope of this study is that cyberattacks happen very frequently, but that not many of them lead to catastrophic losses, either in the sense of great personal injury or involving great financial losses. Moreover, the way in which one could deal with financial losses due to cyber security would also require a separate treatment. Cyberattacks, on the one hand, are man-made; the detection rate, on the other hand, is very low, and the mechanisms proposed here to address man-made disasters, therefore, cannot automatically be transposed to the case of cybercrime. In this sense, the losses resulting from cyberattacks are to some extent more comparable to losses resulting from natural catastrophes. An important difference, however, is that the possibilities for potential victims of cyberattacks to take preventive measures are much more pronounced than in the case of losses resulting from natural disasters, such as flooding or earthquakes. The main demand in the case of cyberattacks, moreover, is often increased cybersecurity rather than compensation of specific financial losses. Steps have been taken towards the application of some of the instruments discussed in this report, like cyber insurance and risk-sharing agreements, to the case of cybersecurity. However, the idiosyncrasies of cybersecurity are such that they deserve separate treatment. This is why we will point out cybersecurity as one possible avenue for future research in our concluding chapter (VII).

As far as the method for this study is concerned, we will build on a comparative study of 2006, in which the financial compensation for victims of catastrophes was sketched from a comparative legal perspective. That study also discussed the four countries that are central to this study. However, that study is now more than ten years old, and several evolutions have taken place in the countries under discussion that need to be taken into account. In order to provide a consistent picture of the particular legal system, a summary will be provided of the results of the 2006 study to some extent. An update will be provided on important changes that

took place. This update will concern not only new evolutions in legislation or policy, but also the application of specific policy tools to new disasters. This study also relies on other research done in this domain and will build on the doctoral dissertation by Véronique Bruggeman from 2010 (*Compensating Catastrophe Victims: A Comparative Law and Economic Approach*). Bruggeman also examined France and Belgium, which can undoubtedly be a useful starting-point. More recently, Faure and Hartlief have compared the financial compensation regimes for victims of catastrophes in Belgium and the Netherlands (*TPR*, 2015, 991-1053), and Faure has analysed liability and compensation mechanisms as tools for reducing disaster risks (*Stanford Journal of International Law*, 2016, 95-178). All these studies were a point of reference and starting-point for the current study.

Two approaches are the leading methods for this study. In the economic approach to law, already mentioned above, a lot of attention has been paid to compensation for victims of catastrophes, and specific attention has been paid to the effects of various *ex post* compensation mechanisms on *ex ante* incentives for disaster risk reduction. The economic approach to law also has the advantage that it allows for an effectiveness analysis. This method can be employed to analyse to what extent a particular goal (such as adequate financial compensation for victims and/or *ex ante* disaster risk reduction) can be achieved through a specific institutional design.

Without repeating the findings of the law and economics literature at this point, the main results can be summarized as follows: 1) the *ex post* compensation mechanism should be shaped in such a manner that effective *ex ante* incentives for prevention are provided, as *ex post* recovery will affect *ex ante* prevention; 2) *ad hoc*, *ex post* government compensation will not provide effective *ex ante* incentives for prevention and may dilute incentives to purchase insurance; 3) insurance is better able to provide *ex ante* incentives for prevention via effective risk differentiation; 4) given systemic underestimation of the catastrophic risk by potential victims, mandatory comprehensive cover can improve both *ex ante* prevention and *ex post* compensation; 5) the supply of catastrophe cover can be stimulated through the government by acting as reinsurer of last resort, and 6) particularly in developing countries, the affordability of the insurance premium should be stimulated through a voucher system that reflects risk and incentivizes potential victims to adopt risk-reducing measures.

The functional comparative method has been employed in order to analyse to what extent the two main goals of an adequate financial compensation system can be reached: 1) adequate *ex post* financial compensation for victims and 2) *ex ante* incentives for disaster risk reduction. In alphabetical order, this study sketches the financial compensation system in Belgium (II), then moves to France (III) and Germany (IV) and finally discusses the Netherlands (V) to outline their current systems and their historical evolution as well as the reasons for recent legislative

changes. Of course, this study only examines those legal details that are crucial from the perspective of this study (law and economics methodology), focusing mainly on the system's financing (private or public), the financial compensation provided, government involvement, and incentives for prevention. One should note, however, that this study does not address the general question of whether and to what extent private insurance results in better compensation than public catastrophe funds. This is an issue that has already been dealt with extensively, mostly in the law and economics literature. Our main goal is to take this literature as one of the study's starting-points and then engage in an institutional comparative analysis. The critical comparison will specifically examine to what extent the situation in the Netherlands shows particular gaps in comparison with the other countries (VI).

II BELGIUM

A NATURAL DISASTERS

1 INTRODUCTION

The types of natural catastrophes to which Belgium is exposed are relatively limited. The most extensive damage can be caused by storms, heavy rainfall and flooding, as Belgium has many surface waters, although there is the possibility of an exceptional earthquake, of which there have been instances in the province of Limburg. Moreover, the various studies on the potential consequences of climate change, listed in IPCC (2007), make clear that Belgium is potentially exposed to increasingly severe natural catastrophes.

While Belgium is exposed to a number of natural hazards, there have been few significant catastrophic losses in the past few years. Nevertheless, as regards the flooding risk in Flanders, the Administration for Environment, Nature, Land and Water Management (AMINAL) of the Ministry of the Flemish Region calculated that 72,000 hectares, or five per cent of the territory of the Flemish Region, could be identified as flood-prone, 6,166 hectares of which are situated in residential zones. Between 60,000 and 80,000 residences are represented, therefore, based on an average surface of 784 square meters per property.

Until 2003, Belgium only had a patchwork of regulations directly or indirectly applicable to victims of natural catastrophes seeking full financial compensation. Indeed, tort law, insurance law, various branches of social security law and general solidarity needed to be cumulated to achieve financial compensation. Theoretically, victims could call on liability law to seek (full) compensation. Tort law however, only applies when a liable tortfeasor can be found, which will rarely be the case after a natural catastrophe. Hence, the victim will have to rely on other sources of financial compensation. Yet, most of the existing legislation from the other branches of law granted only partial compensation, and several conditions had to be met and procedures usually took a long time. This situation changed drastically in 2005, when new legislation on the financial compensation of victims of natural catastrophes was approved.

2 EVOLUTION OF INSURANCE COVERAGE

Act of 12 July 1976

After a whirlwind caused considerable damage to some parts of Belgium in January 1976, the Council of Ministers decided to elaborate basic legislation allowing for the reparation of damage to private property due to natural disasters. The Act of 12 July 1976 on the Repair of Certain Damage Caused to Private Goods by Natural

Disasters, which also is applicable to agricultural damage caused by natural disasters, installed a so-called Disaster Fund (part of the National Cash Registry for Disaster Damage). In the aftermath of a natural catastrophe, this Disaster Fund is financed by advances from the Treasury, loans and, where necessary, allocations drawn from the state budget, gifts, legacies and profits from the National Lottery (Art. 37). The Federal Disaster Fund used to compensate, in instalments, for direct material damage caused by a natural disaster up to the amount of EUR 64,800, while a deductible of EUR 250 was applied – on the condition that the total direct damage to private goods amounted to at least EUR 1,250,000 and the average damage per family amounted to at least EUR 5,000. Full financial compensation was granted only if the money was used for restoration or construction works within the following three years.

The Disaster Fund cannot be considered to be a great success as citizens had to wait for a considerable amount of time before receiving financial compensation for damage, the government had to recognize the event as a natural disaster and filing an application was a very complex procedure. Moreover, financial compensation was granted only up to a certain amount, established in accordance with statutory criteria, without taking into consideration real damage. The area of application of the Act of 1976, furthermore, was narrowly defined, and the damage arising from risks that would be covered by insurance policies under normal circumstances, such as fire, lightning, explosions, hail or storm, was *a priori* excluded from financial compensation. Finally, the legislature opted for a system whereby the financing mechanism only became operative from the moment a catastrophe occurred.

Royal Decree of 24 December 1992

Because the Disaster Fund was financed by general taxpayers on the principle of solidarity, the Belgian government searched for other ways to provide financial compensation for natural catastrophes, such as by calling on the insurance industry. The promulgation of the Royal Decree of 24 December 1992 on Insurance against Fire and other Dangers as concerns the Simple Risks was a first, albeit small, step forward. This Royal Decree was applicable to those insurance agreements in which simple risks were insured against damage due to: 1) fire and related dangers (such as a lightning strike, explosion, implosion and contact with an aircraft or any other vehicle or animal); 2) electricity; 3) attacks and labour conflicts; 4) storm, hail, ice and snow pressure; 5) natural disasters; 6) water; 7) broken windows; 8) theft; 9) indirect losses; and 10) industrial damage, for which daily compensation was guaranteed.

Royal Decree of 16 January 1995

Although damage caused by storms could in principle be partially covered by most fire insurance policies, the Disaster Fund did pay out EUR 15,284,632 of compensation after windstorm Daria hit the country in 1990. Consequently, the Fund was

unable to build up financial reserves, and in 1990 and in 1992 the former Minister of Economic Affairs, Willy Claes, proposed to transfer the tasks of the Disaster Fund to the private insurance sector. This is one of the reasons why the Royal Decree of 16 January 1995 established that ‘storm coverage’, which legally comprised hail, ice and snow pressure, would be an obligatory extension of every fire insurance policy that covered simple risks. The legal rule was then based on the principle that property would be insured against storms that had a wind speed of no less than 100 kilometres per hour. Furthermore, the Royal Decree foresaw a minimum level of coverage and authorized the exclusion of those goods that were highly vulnerable to the storm risk, such as light or easily movable constructions, open buildings and bell towers.

Act of 21 May 2003

The Act of 21 May 2003, modifying the Act of 25 June 1992 on the Land Insurance Agreement, and the Act of 12 July 1976 on the Repair of Certain Damage Caused to Private Goods by Natural Disasters, in turn introduced flood coverage as a mandatory extension to the fire insurance policies concerning simple risks, in the same way as storm coverage had been introduced in 1995. This mandatory extension only applied, however, to property situated in flood-prone areas (an optional extension being available for property outside this risk area), which had to be demarcated by the country’s three Regions. As a result, the Disaster Fund no longer needed to intervene as flood risk was insured or at least insurable. The Act of 1976, though, continued to exist for those events and properties not included in the Act of 2003, namely for those goods that were not insured because of the victims’ low financial capabilities and for agricultural damage. In addition, the Act of 2003 foresaw the creation of an Office of Tariffication, providing insurance to those who did not have any coverage either because no agent was willing to assume the risk or because the requested premium was too high.

Act of 17 September 2005

The Act of 21 May 2003 did not enter into force, however, mainly due to difficulties with the demarcation of the flood-prone areas. On 23 January 2004, moreover, the Ministerial Council decided to consolidate the loan that it had granted to the Disaster Fund. The Belgian State then argued that it would be better off if a new act transferred natural disaster coverage to the insurance sector. The Act of 2003, therefore, was amended by the Act of 17 September 2005, building on the former legal provisions.

The Belgian legislature created general solidarity between all citizens who bought fire insurance for the so-called simple risks – comprising 90-95 per cent of the Belgian population – by introducing a mandatory extension to natural disaster coverage, which consists of four perils: flooding (water coming from below); earthquakes; the flowing over or the impoundment of public sewers; and landslide or

subsidence. Fire insurance for simple risks and coverage for natural catastrophes are inextricably bound up, meaning that if fire insurers refuse to offer coverage for natural disasters, they cannot offer fire insurance itself. The extra insurance premium will be adjusted to every individual case, and one can expect it to be between EUR 3-4 per EUR 25,000 insured. The maximum indexed deductible for disaster coverage amounts to EUR 610 per claim.

This covers compensation for all direct damage to the insured property caused by a natural catastrophe or by an insured peril that results directly from it (notably fire, explosion or implosion) as well as damage to the insured property due to measures taken by a legally constituted authority to safeguard and protect goods and persons, the clearance and demolition expenses associated with reconstruction of the property and accommodation costs in the three months following the catastrophe if the dwelling became uninhabitable. Non-gathered crops, soil, objects located outside the building (except those permanently attached), easily movable constructions, garden houses and vehicles, among other things, are excluded from retribution, unless otherwise stipulated.

Furthermore, each insurer has been given some limits regarding the monetary burden they should bear as disaster coverage may involve catastrophic risks that can reach extraordinary proportions – the *ratio legis* being to avoid the financial downfall of the insurance companies. Indeed, a limit per insurance company instead of a global limit for the insurance market has the advantage that insurers can precisely calculate the maximum risks they are taking and thus find reinsurance more easily (Art. 68-8 § 2, 1992 Insurance Act). When this limit is attained, the National Cash Registry for Disaster Damage intervenes with a general upper limit of EUR 280 million (EUR 700 million for earthquakes) per event (Art. 34-2, 1° and 34-3 of the Act of 12 July 1976). If these amounts prove to be insufficient to fully compensate the victims, the intervention of the Cash Registry will be reduced in proportion.

These limits appear to be adequate to compensate for most losses, especially considering the fact that granted compensations for the three most destructive natural catastrophes that hit Belgium between 1976 and 2005 (the storms of 25-26 January 1990, the earthquake of 8 November 1983 at Liège/Luik and the abundant rains of 13-15 September 1998) amounted to EUR 74.7 million, EUR 42 million and EUR 38.1 million, respectively.

In addition, the 2005 Act set up an Office of Tariffication. The insurance sector has calculated that between three and four per cent of the insured risks for fire damage are in fact uninsurable for flooding and that approximately eight per cent of those insured against fire will see their premium double. It is for these risks that the Office of Tariffication will specify the premium conditions.

To conclude, the Act of 17 September 2005 allows victims of natural catastrophes to turn to their fire insurer (as long as their damage relates to the simple risks in the sense of fire insurance) without recourse to the Disaster Fund, which is advantageous for both the victims and the Belgian state. As far as the victims are concerned, they now avoid the long and often complicated administrative procedure associated with the Disaster Fund. The damaging natural peril no longer needs to be declared a natural catastrophe by the Ministerial Council. As for the Belgian state, the main burden of compensating the victims of natural catastrophes is now borne by the insurers. The Disaster Fund only intervenes if the limit of the individual insurance company has been reached or if the damaged property is not insured due to the victims' financial position.

Act of 4 April 2014

The Act of 4 April 2014 repeals most of the provisions of the 1992 Insurance Act. However, all relevant articles relating to insurance against natural disasters as concerns the simple risks have been taken over verbatim in the new Act of 2014.

Decree of 3 June 2016 (Flanders)

Following the sixth state reform (via the Special Act of 6 January 2014), the three Regions in Belgium have been attributed the competence of legislating and implementing financial compensation in response to damage caused by disasters from 1 July 2014 onwards. Consequently, Flanders promulgated the Decree of 3 June 2016 regarding the Compensation for Damage caused by General Disasters in the Flemish Region. This decree unites the principles of compensation, reimbursement procedures and financing methods for damage suffered from general disasters on the territory of the Flemish Region. It builds on the basics of the Act of 12 July 1976, which it repeals while also pursuing administrative simplification and updating the reimbursement process. The Decree of 3 June 2016 has been further implemented by the Decision of the Flemish Government of 23 December 2016.

In Flanders, exceptional natural phenomena that meet the financial criterion of damage to private and public goods exceeding EUR 30 million or, if this financial criterion is not met, that meet specific scientific criteria, can be recognized as a 'general disaster' allowing victims to turn to the Flemish Disaster Fund. The specific criteria, laid down in the Decision of 23 December 2016, are based on the return period of a disaster or on an established scientific scale.

In order to determine the geographical extent of a general disaster, the local governments are given up to sixty days after the exceptional natural phenomenon to request that their territory be included in the geographical demarcation area of the general disaster. This application period for being recognized by the Flemish Government has been shortened in comparison with the 1976 Act aiming to accelerate the procedure.

The damage needs to be direct, material (not moral) and proven and can only relate to physical goods. Contrary to the 1976 Act, this decree considers the fire insurance coverage for simple risks: the physical goods which can be insured under this insurance coverage are excluded from the scope of the 2016 Decree. This fire insurance coverage for simple risks provides coverage against damage caused by lightning, explosion, storm (including the gusts of wind with a local character), hail, ice and snow pressure, flooding, overflowing or pushing up public sewers, landslides or subsidence and earthquakes.

Requests for financial compensation need to be submitted within three months following the publication of the recognition decision in the Official Journal. The principle laid down in the 2016 Decree is that financial compensation should be used to repair the damage. The compensatory amount is calculated by applying coefficients to the total net amount of the damage, with a deductible of EUR 500.

Finally, like the 1976 Act, the Flemish Government acts as a guarantee fund for insurers in case they are up against harsh financial conditions, and the intervention of the Flemish Government will then cover the part of the financial compensation that insurers cannot pay to their insureds.

B TECHNOLOGICAL DISASTERS

1 STRICT LIABILITY

Belgian law has created quite a few strict liabilities for technological disasters. There is strict liability for the guardian of a defective object (Article 1384, al. 1 of the Civil Code), for employers and other superiors for tort committed by their agents (Article 1384, al. 3 of the Civil Code), for the owner of an animal for damage caused by the animal (Article 1385 of the Civil Code) and for the owner of a building with respect to damage caused by the partial or complete collapse of a building if this was caused by a construction defect or a lack of maintenance (Article 1386 of the Civil Code).

Specific statutes also introduce strict liabilities with respect to damage caused by mines, the transport of gas, damage caused by toxic waste, fire or explosions in public buildings and nuclear accidents. This does not imply, however, that the Belgian rules with regard to strict liability have been developed in a systematic manner, and the reality is rather that specific statutes have introduced strict liability *ad hoc*, usually on the occasion of a scandal or major accident. It is unclear, for example, why strict liability is introduced for fires or explosions in public buildings but not for operators of a petrochemical plant.

2 SOLVENCY GUARANTEES

Belgian law has a large number of mandatory solvency guarantees, such as compulsory liability insurance. An important example of such a mandatory solvency guarantee is the strict liability for personal injury and material damage caused to third parties as a result of fire or explosion in a public building – without prejudice to the ordinary recourse to the persons responsible for the damage. The act creates not only strict liability but also a mandatory solvency guarantee: a place cannot be opened to the public if the strict liability to which it is exposed has not been adequately covered by liability insurance. The amount to be covered has been regulated in a Royal Decree: the limit is EUR 14,873,611,49 for damage related to personal injury; the insurance limit is EUR 743,680,57 for material damage. These amounts are increased with inflation. According to this system, if an explosion took place in a public place (such as a dancing), strict liability and mandatory liability insurance up to the limits mentioned would be applicable.

As a result of this strict liability in addition to mandatory liability insurance, victims of a technological disaster in a public building in Belgium have a reasonable likelihood of being compensated. An important aspect is that victims also have priority over other creditors because victims have a so-called direct action against the liability insurer. This, therefore, precludes that the insured amounts are no longer available to compensate the victims of the accident in the case of a bankruptcy, for example. Of course, questions may still arise regarding the adequacy of the financial compensation mechanism.

In the case of non-public buildings, activities may still take place in Belgium which could be considered dangerous (such as the operation of a petrochemical plant) but where no specific strict liability applies to personal injury. In the case of such a technological disaster, the strict liability of the guardian of a defective object (based on Article 1384, al. 1 of the Civil Code) might be applicable. Mandatory liability insurance often applies to risky activities, even though this may not only be imposed through a statutory duty. Insurance cover is often required as a condition in the environmental permit of a specific installation. Another problem is that there may be cases where there is no mandatory solvency guarantee even though there is strict liability. The general picture in Belgium, however, is that strict liabilities or mandatory solvency guarantees – and in many cases even both – have been created for most high-risk activities that could create technological disasters.

3 RAPID CLAIMS SETTLEMENT

A new Belgian Act was promulgated on 13 November 2011 concerning financial compensation for victims of technological accidents; this came into force on 1 November 2012. Its emergence was related to the disaster of an exploding gas pipeline operated by Fluxys, a Belgian company, which happened on 30 July 2004 in Ghislenghien. In this accident, 24 people died and more than 150 were injured. As

the Belgian civil procedure is linked to the criminal procedure, most victims were compensated only seven years after the incident. This explains the need for a new act specifically aiming to accelerate victim compensation.

The Act applies to so-called ‘technological disasters of great extent’, which are defined as technological incidents involving bodily injury to at least five persons (through death or hospitalization). The Act applies when a specific committee, referred to as a committee of wise men, declares the incident to be an exceptional disaster, and victims must claim financial compensation within six months from the publication of the committee’s decision. Compensation matters are then taken care of by the Belgian motor insurance guarantee fund. A Special Unit in charge of victim support is composed by the public prosecutor, and the Unit draws up a list of victims and communicates this list to the Fund. Victims can ask for financial compensation by addressing either the Fund or the Special Unit by registered letter. In principle, the fund only compensates bodily injury and intervenes solely in addition to social security and insurance mechanisms. Victims are free to choose to claim under the Act or under Belgian Civil Liability Law.

The Act does not specify the conditions under which the fund will compensate. Art. 10 of the Act only specifies that the fund will compensate victims or their descendants according to the rules of common law, considering the exceptional character of the damage.

Within three months after the fund has received the list of the victims, the fund’s administration will formulate an informed advice, explaining whether the damage is of such a nature that it should be compensated on the basis of the statute. If this financial compensation advice is affirmative and if the damage can be quantified, it will provide an offer of compensation. This offer is final. According to Art. 14, acceptance of the final offer from the fund by the victim will be considered as the final settlement of the case. If the victim disagrees with the fund’s decision the according to Art. 10, he or she can sue the fund before the civil court.

The financing scheme is based on pre-payment by insurance companies. Art. 16 holds that, when the decision of the committee of wise men to declare the incident a technological disaster has been published, the fund will estimate the damage and subsequently ask private insurers to pay to the fund on the basis of their market share. Insurers working in the field of civil liability insurance (with the exception of insurances covering liability in the field of motor vehicles) are required to contribute to the fund on the basis of Art. 16, para. 2. The total maximum amount insurers will have to contribute is EUR 50 million per year.

The fund, moreover, is subrogated in the victim’s rights against the liable tortfeasor and his or her insurer. Art. 17 sets out that the fund recovers the damages paid,

including the interest as well as the fees and costs for managing the fund, from the liable tortfeasor and its insurer. When no liable tortfeasor can be identified or when it is impossible to recover the amounts from the liable tortfeasor (on grounds of insolvency), the fund requests repayment from the National Disaster Fund. The amounts that can be recollectd by the fund from either the tortfeasor (or his/her liability insurer) or from the National Disaster Fund will then be paid back to the insurance companies that contributed in the first place, according to their market share.

Art. 20, however, stipulates that if it appears after a procedure that there is no liable tortfeasor, the entire compensation costs will be paid by the National Disaster Fund. If, on the other hand, there is a liable tortfeasor, but it is impossible to obtain financial compensation from him or her (because of insolvency), the National Disaster Fund takes care of 50% of the costs that could not be recovered. In that case, the remaining 50% will presumably remain with the insurers who contributed.

Regarding the Ghislenghien incident in which the fund intervened, all 140 files have been closed, and a total of EUR 6,599,919 was awarded in compensation.

C NUCLEAR ACCIDENTS

1 GENERAL FRAMEWORK

We will now sketch the general framework regarding the financial compensation of victims of nuclear accidents. As all four countries under discussion are members of the relevant conventions, the framework is applicable to all countries and will obviously not be repeated. It is only its implementation in the particular countries which differs.

Two separate international compensation regimes were established in the 1960s, and both were substantially revised after the Chernobyl accident of 1986. The Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 (Paris Convention) and the Supplementary Convention to the Paris Convention on Third Party Liability in the Field of Nuclear Energy of 31 January 1963 (Brussels Supplementary Convention) were developed under the auspices of the OECD's Nuclear Energy Agency (NEA). The aim of the 1963 Brussels Supplementary Conventions is to supplement the compensation system provided in the Paris Convention 'with a view to increasing the amount of compensation for damage which might result from the use of nuclear energy for peaceful purposes'. The second regime was developed under the aegis of the International Atomic Energy Agency (IAEA): the Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 (Vienna Convention). These two regimes are usually referred to as the first generation of nuclear liability conventions.

The 1986 Chernobyl accident triggered an intensive discussion on the limitations of both conventions and resulted in an eventual revision process of the existing regimes. The so-called second generation of nuclear liability conventions was established after that, including the Joint Protocol of 1988 Relating to the Application of the Vienna Convention and the Paris Convention (Joint Protocol), the Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (Protocol to the Vienna Convention), the Convention on Supplementary Compensation for Nuclear Damage (CSC), the 2004 Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy (Protocol to Amend the Paris Convention) and the Protocol to Amend the Convention of 31 January 1963 Supplementary to the Convention of 29 July 1960 on Third Party Liability in the Field of Nuclear Energy (Protocol to the Brussels Supplementary Convention).

Several fundamental principles underlie the International Nuclear Liability Conventions:

Strict liability

The Paris Convention establishes a system of absolute liability. According to this system, the operator is liable for damage caused by a nuclear incident in a nuclear installation or involving nuclear substances coming from such installations. Similar stipulations regarding absolute liability and exonerations can also be found under the Vienna Convention. The second-generation conventions have not changed the principle that strict liability applies to the operator of a nuclear power plant. An important change that took place, however, with regard to the operator's available defences, is that natural disasters are no longer an applicable defence.

Limited liability

Under the Paris Convention and the Vienna Convention, the operator's liability is limited both in amount and in time. The Paris Convention sets the operator's maximum liability at 15 million SDRs (around EUR 17.2 million) but allows the Contracting Party to establish a greater or lesser amount by legislation considering the capacity of insurance and financial security. The Contracting Party can also require a lower liability amount according to the nature of the installation. The lower amount should be no less than 5 million SDRs (Special Drawing Rights) (around EUR 5.70 million). By contrast, the Vienna Convention sets the liability cap at no less than USD 5 million.

The liability limitation, however, has been changed under the second-generation nuclear conventions. The Protocol to the Paris Convention increases the limit for nuclear operators to no less than EUR 700 million. The Contracting Party can reduce the liability to no less than EUR 80 million for the carriage of nuclear substances according to the reduced risks. The Convention even allows for the adoption of unlimited liability by the Contracting Parties, as long as the financial security required is no less than the amount mentioned above.

Financial security

Seeking financial security coverage for the operator's liability is important for the international regimes on nuclear liability. Both conventions require the operator to have and maintain insurance or other financial security up to its liability cap.

Additional financial compensation

In addition, the Brussels Supplementary Convention added two additional layers of financial compensation via public funds on top of the first tier of private funds (operator's liability) provided for by the Paris Convention. Indeed, the first tier of the Brussels Supplementary Convention is the insurance coverage of the nuclear operator as established under the Paris Convention. On top of that amount, the Brussels Supplementary Convention provides for two additional tiers of public funds: one 'national' public fund to be made available by the Installation State in whose territory the nuclear installation of the liable operator is situated and one international solidarity fund ('third tier') to be made available by all Contracting Parties according to a pre-determined formula. In particular, according to Article 3 of the Brussels Supplementary Convention, the Contracting Parties undertake that compensation in respect of damage caused by a nuclear accident shall be provided up to the amount of 300 million SDRs per incident (EUR 341.85 million or USD 432,474 million). Such financial compensation shall be provided:

- Up to an amount of at least 5 million SDRs (EUR 5.70 million or USD 7.64 million), out of funds provided by insurance or other financial security, such amount to be established by the legislation of the Contracting Party in whose territory the nuclear installation of the operator liable is situated;
- A second tier consisting of the difference between SDR 175 million and the amount required under the first tier (a maximum, hence, of 170 million SDRs or EUR 193.72 million or USD 259.70 million) out of public funds, to be made available by the Contracting Party in whose territory the nuclear installation of the operator liable is situated;
- A third tier of 125 million SDRs (EUR 142.44 million or USD 19.96 million), out of public funds to be made available by the Contracting Parties according to a formula for contributors which is based on GNP and the thermal capacity of the reactors.

Under the Brussels Supplementary Convention, each Contracting Party has certain freedoms. It can establish the operator's maximum liability, pursuant to the Paris Convention, at 300 million SDRs, and provide that such liability shall be covered by the nuclear operator's insurance; in this case, the Installation State has met its obligation under the Convention and need not provide for national public funding in the second layer. However, the Contracting Party can also set the maximum liability of the operator at an amount at least equal to the nuclear operator's insurance and provide that, in excess of such an amount and up to 300 million

SDRs, public funds shall be made available by some means other than as cover for the operator's liability.

As we already mentioned above, important changes occurred in the international regime after the Chernobyl accident. We mentioned that first-tier liability (the liability of the operator of the nuclear power plant) increased to EUR 700 million. Moreover, according to the Protocol to the Brussels Supplementary Convention, the Contracting Parties will undertake that financial compensation in respect to nuclear damage shall be provided up to an amount of EUR 1.5 billion per nuclear incident. This will be divided as follows:

- Up to an amount of at least EUR 700 million: funds provided by insurance or other financial security or out of public funds provided pursuant to Art. 10(c) of the Paris Convention;
- Between this amount and EUR 1,200 million: public funds to be made available by the Contracting Party in whose territory the nuclear installation of the operator liable is situated;
- Between EUR 1.2 billion and EUR 1.5 billion, out of public funds to be made available by all the Contracting Parties according to the formula for contributions.

Finally, the Convention on Supplementary Compensation for Nuclear Damage (CSC), adopted on 12 September 1997, is a new and independent legal instrument, which means that a state does not need to be a party to the Vienna or Paris Conventions in order to become a party to the CSC.

According to Article III.1.A of the CSC, the Installation State shall ensure the availability of at least 300 million SDRs (EUR 341.85 million or USD 458.29 million). This provision means to compel the Installation State to ensure that 300 million SDRs are available: the Installation State is free to choose how this amount is funded (private insurance, regional agreement, etc.). A state meets its obligation under Art. III.1.A of the CSC when it imposes liability on the operator for the entire amount. So, as such, this Article does not oblige a state to make public funds available. However, according to Article II.1.B of the CSC, the Contracting Parties shall, beyond the amount available under the first tier, make public funds available.

If one were to summarize the situation, one could hold that, in addition to the nuclear operator's individual liability (with financial caps), there are two additional types of funding mechanisms: there is an obligation of an Installation State to make certain amounts of money available, which it can do either by providing for public funding, or by making the nuclear operator liable for the total amount; this is the second tier of the Brussels Supplementary Convention and the first tier under the CSC.

Finally, there is a system that can be called an international solidarity fund, funded by all Contracting Parties. This public funding cannot be shifted as this is the case for a third tier of the Brussels Supplementary Convention and for the second tier under the CSC.

The total amounts available in the nuclear liability regime have been summarized in Table 1:

Table 1 Compensation amounts available under the international nuclear liability conventions

What Convention?	Who pays?	Amount in million EUR	
		First generation	Second generation
Paris Convention	Nuclear operator	57	700
Brussels Supplementary Convention	Installation State (or nuclear operator)	193.7	500
	Collective State Fund	142.4	300
Total NEA-regime		341.8	1,500
Vienna Convention	Nuclear operator	4.2	170.9
	Collective State Fund	-	170.9
Total Vienna Convention		4.2	341.8
Convention on Supplementary Compensation	Operator/Installation State		341.8
	Collective State Fund		341.8
Total csc			683.7

Table 1 demonstrates that, under the second-generation nuclear compensation scheme, public funding is either newly created or kept at the same level as in 1963 in relative terms. In absolute terms, there is considerably more public funding in the second-generation conventions: under the 2004 Brussels Supplementary Convention, the public intervention has more than doubled and under the IAEA regime, no public intervention existed under the first-generation conventions.

It is important to underline that out of the four new nuclear liability instruments that resulted from the revision exercise, only two have entered into force so far. The Protocol to the Vienna Convention entered into force on 4 October 2003; the CSC entered into force on 15 April 2015.

2 IMPLEMENTATION IN BELGIUM

Rules on nuclear third party liability are contained in the Act of 22 July 1985 on Third Party Liability in the Field of Nuclear Energy, as modified. This law implements the 1960 Paris Convention and the 1963 Brussels Supplementary Convention as well as its protocols. The 1985 Act, as modified, lays down the principle of strict liability, limited liability in amount and time, channelled to the operator of a

nuclear installation. In this respect, Article 7 of the law establishes the maximum amount of the operator's liability for nuclear damage at EUR 1.2 billion. A royal decree can increase or decrease this amount in order to fulfil Belgium's international obligations as well as to take into account low risk installations or transport; however, it may not set a level lower than EUR 80 million for transportation and EUR 70 million for the nuclear installations.

Pursuant to the terms of the law, the operator is obliged (in conformity with Art.10 a) and d) of the Paris Convention) to take out insurance or another form of financial security to cover his or her liability up to the amount set in the law (Article 8). The private insurance market, however, does not have sufficient capacity to complete the totality of such a high liability risk, which the operators nevertheless need to have insured. The problems arise in particular for the coverage of liability claims that might arise more than ten years after the accident, and to a lesser extent, the coverage of damage to the environment. There are insurance policies available for this type of risk, but the coverage amounts offered in the market do not reach the required amount of EUR 1.2 billion or – for low-risk installations or transport – EUR 297 million. This is why the Act of 29 June 2014 (modifying the Act of 22 July 1985) has introduced a state guarantee, to be enjoyed by the operators of nuclear installations against a fee and insofar as the private insurance market does not offer the coverage (Article 10/1).

Consequently, the Royal Decree of 10 December 2017 establishes a guarantee programme for legal liability in the area of nuclear energy. This Royal Decree was promulgated after the European Commission allowed the programme in the framework of Articles 107 and 108 on state support. As state intervention must be subsidiary to the private market, the premium from the operator to the state has been established at an amount that is higher than the market price (the supplement is around 15%). This should encourage operators and insurers to develop insurance solutions instead of appealing on the state. The operators are free to choose their affiliation to the guarantee programme, and the amount compensated by the state will have to be repaid by the liable operator, as long as this amount does not exceed the liability ceiling laid down in the Act of 22 July 1985. Finally, the damage caused by a nuclear accident should be covered by the operator's insurance policies in the first place. The state should only intervene when the amount of the damage exceeds the insured amount to the extent of the surplus, to warrant the liable operator in case he or she fails to compensate.

Article 23 of the law establishes a prescription period of thirty years for nuclear physical injuries and of ten years for other nuclear damage from the date of the nuclear incident in respect of the right to claim financial compensation from the operator. The state is responsible for payment of compensation in respect of claims for nuclear physical damage which are time barred, within a period between 10 and

30 years from the date of the incident. From 1 January 2019 onwards, the state's obligation to compensate will be transferred to the operator.

Belgium also ratified the 1971 Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material on 15 June 1989.

D TERRORISM

1 PROPERTY DAMAGE

In Belgium the terrorism risk is regulated through an Act of 1 April 2007, which entered into force on 1 May 2008. In fact, the Belgian legislator copied the Dutch model of the *Nederlandse Herverzekeringsmaatschappij voor Terrorisemeschade* (NHT), which will be discussed below. This is made clear in the preparatory works of the Belgian Act. The Belgian legislator praised the Dutch model for providing a pragmatic solution and held that the insurance market in Belgium was comparable to that in the Netherlands, and it found inspiration, therefore, in the Dutch legislation.

The Belgian Act can be called upon when a dedicated Committee has judged that the particular event(s) should be considered a 'terrorist action' (Art.6). In such a case, the 2017 Act, like the Dutch model, provides an interesting combination of interventions by the insurance company, reinsurers and by the Belgian state. A model has been elaborated in which a first layer of financial compensation is provided by all Belgian insurers up to a limit of EUR 300 million. If this amount is insufficient to cover the loss, a second layer will intervene, which is provided through the reinsurance market up to an amount of EUR 400 million. And if this amount should be insufficient, finally, the Belgian state intervenes up to a limit of EUR 300 million, like in the Dutch system. The total amount of compensation (not indexed), therefore, is constituted as follows:

Insurers	EUR 300 million
Reinsurers	EUR 400 million
Belgian state	<u>EUR 300 million</u>
total	EUR 1 billion

An association is created, which is in fact an insurance pool, that will manage the terrorism risk. The pool is called the Terrorism Risk Insurance Pool (TRIP). Although the scheme is not compulsory, it has attracted more than 95% participation from amongst the insurers operating in Belgium. The Belgian state only intervenes after all others (insurers and reinsurers) have intervened and only if their amount (a total of EUR 700 million) would not be sufficient to cover the loss. Like in the Dutch example, the reinsurance layer provided by the Belgian state, moreover, is not provided for free, but the Belgian state is compensated for this inter-

vention. This was necessary to comply with the prohibition of state aid contained in European law.

Legal doctrine in Belgium holds that this financial compensation of terrorist acts by creating a pool has been effective in covering terrorism-related risks. The public-private partnership between insurers, reinsurers and the state is praised for providing relatively large amounts of cover (EUR 1 billion) in three layers.

Compensation of damage to industrial property, including contents located at a single company site, will be limited to EUR 75 million per insured and per year, given that the 2007 act mainly aims at compensating damage to persons (Article 7 §2). There is also a compensation percentage that is applied to pay-outs. The percentage rates are worked out using three broad headings, which are one percentage rate for personal injury, one percentage rate for material damage and one percentage rate for moral damage. The deductible is 10% of the damage cost when damage from a terrorist act has occurred to industrial business, and a 10% deductible is applied to damages caused by a nuclear bomb for risks other than motor vehicle third party liability, strict liability for public places, workmen's compensation insurance, life assurance and health insurance.

2 PERSONAL INJURY

It cannot be excluded that some victims of terrorism will not receive any compensation through TRIP because the conditions in the insurance contract are not fulfilled. To avoid these persons having to carry all damages themselves, the Act of 1 August 1985 on Fiscal and Other Provisions has been supplemented with a special subchapter on governmental help for victims of acts of deliberate violence. The Fund for Intentional Acts of Violence can pay out compensation to uninsured victims who are confronted with personal or physical damages. The government can increase this sum after a terrorist attack (Art.37bis). The King needs to declare the event an act of terrorism (Art.42bis).

The fund is financed by fixed contributions of all persons sentenced to criminal or misdemeanour penalties (Art. 29), but extra contributions can be made, if necessary, by the Treasury, loans, gifts and legacies, part of the profits of the National Lottery and other revenues determined by the King (Art.42bis).

3 THE TERRORIST ATTACK ON BRUSSELS AIRPORT

On 22 March 2016, several terrorist attacks were committed in and around Brussels (in particular, in Brussels Airport and in the Brussels metro), in which a total of 35 persons were killed. The damage resulting from the attacks in Zaventem and Molenbeek, falling under the scope of the Act of 1 April 2007, amounts to a total of EUR 168 million. The distribution of this amount has been estimated as follows: damage to persons 80%, material damage 15% and non-pecuniary loss 5%. The

amount remains well below EUR 1 billion, which is provided for in the Act of 1 April 2007.

Following the attacks, the Act of 30 May 2016 was adopted, amending the Act of 1 August 1985 on Fiscal and Other Provisions, with regard to assistance to victims of deliberate acts of violence. The amending 2016 Act has introduced the following changes:

- The ceilings for financial compensation have been doubled: compensation will be awarded when the damage amounts to more than EUR 500 and up to EUR 125,000.
- Certain conditions have been relaxed or were even deleted when aid is requested for damage related to terrorist attacks. In this specific context, it is not necessary to deposit a complaint or to apply for civil party status first.
- Belgians who have fallen victim to acts of terrorism in a country that does not provide for a settlement for this type of event can also appeal to the Fund for Intentional Acts of Violence.

A Commission for financial assistance to victims of acts of deliberate violence and occasional rescuers has been established. This Commission deliberates on applications for emergency aid, financial compensation or additional assistance. A subsection of the Commission specializes in dealing with applications from victims of terrorist attacks.

It should be noticed that the contribution by the state has a subsidiary character, meaning that victims must be unable to receive sufficient compensation for their damage in any other way. Therefore, the Commission takes into account:

- the solvency and the potential instalments of the aggressor;
- the contribution of the health insurance fund or the work accident insurance institution;
- possible compensation in the private insurance framework.

The Commission can grant equitable assistance but does not guarantee full compensation.

Two months after the attacks, the first emergency aid decisions were officially notified to the victims concerned, and the first payments were made. Nevertheless, one year after the terrorist attacks, many victim organizations complained about the slow payment of damages and the administrative burden. Following the Belgian regulation, the financial compensation of material and non-material damage caused by terrorism is primarily a task for insurance companies. Because insurance companies may take a long time to determine the exact extent of the damage, however, the Commission can pay an advance of up to EUR 30,000 in urgent cases (i.e. the emergency aid). The first figures show that the insurance companies have put

aside EUR 136 million for compensation payment but have only paid out EUR 16 million. More than half the victims were still waiting (dd. March 2017) for part of their compensation, and a quarter of victims did not receive anything at all. The Commission paid out EUR 1.2 million in advances and helped 160 victims, while it received 398 applications.

In addition, following the Act of 18 July 2017, it was decided that Belgians who are victims of a terrorist attack will receive a lifelong pension. They get their own ‘statute of national solidarity’, which is comparable to the statute of civilian victims from World War II. As a result, in addition to their right to a benefit/pension, they also receive full reimbursement of their medical costs, if these are covered neither by insurance nor by the Fund for Intentional Acts of Violence.

E SUMMARY

As the overview shows, Belgium has gone through an interesting evolution and many steps have been taken in recent years. With regard to natural disasters, Belgium started with a model of national solidarity with the Disaster Fund. With the statutes of 2003 and 2005, however, the role of this Disaster Fund has been seriously reduced. Belgium *de facto* followed the French model by mandatorily adding first-party cover for a large group of natural disasters to voluntarily purchased fire insurance. With regard to technological disasters, it is striking that Belgium has a large number of mandatory solvency guarantees, forcing operators to seek financial cover for the consequences of their liability. Since 2012, moreover, Belgium has also had a specific model for rapid claims settlement in the case of technological disasters.

With regard to nuclear risk, Belgium implemented the Nuclear Liability Conventions. The operators’ liability is now set at the total amount of EUR 1.2 billion; in addition, there is a substantial state guarantee. Terrorism risk in Belgium is regulated through the Act of 1 April 2007, which created the Terrorism Risk Insurance Pool (TRIP), which provides a total compensation amount of EUR 1 billion on the basis of a multi-layered compensation system. TRIP had to be applied after the 22 March 2016 terrorist attack on Brussels airport. TRIP mainly intervenes for property damage. With regard to personal injury, there is the statute of 1985, which provides compensation to victims after a terrorist attack. Following the Brussels airport attacks, the statutory framework was changed once more with the Act of 18 July 2017, providing for life-long pensions for victims of a terrorist attack.

Summarizing, Belgium has a mixed system, partly following the French solidarity model, first providing generous compensation through a disaster fund for victims of natural disasters, and also covering personal injury resulting from the terrorism risk. At the same time, it also obliges operators to provide proof of their solvency

through a combination of strict liability and mandatory liability insurance, thus also stressing the importance of exposing potential injurers to the social costs of their activity.

III FRANCE

A NATURAL DISASTERS

1 MANDATORY COMPREHENSIVE COVER

France has an elaborate system of first-party insurances for property damage. Eighty-five per cent of all inhabitants of France have such first-party insurance and, hence, a right to financial compensation for property damage within the scope of the insurance policy. A typical example of such a policy is the so-called *multi-risques habitation*, which is commonly requested as a precondition for renting a premise, and which covers most risks with respect to real estate and movables within the house.

In addition to voluntary first-party insurance covering damage against property and covering the insured value of the car and property left in it, the French system also includes a mandatory additional cover for the consequences of natural disasters through the Act of 13 July 1982. This constitutes France's well-known and internationally praised example of mandatory comprehensive disaster insurance. There is, therefore, no generalized duty to insure catastrophic risks in France, but there is a compulsory coverage extension to voluntarily subscribed property insurance contracts. Property damage policies in France are widespread and, consequently, a large group of individuals are forced to pay an additional amount to cover natural disasters.

The Code des Assurances offers a definition of what is considered a natural disaster. Remarkably, the Code defines a natural disaster as an accident that causes damage that is unusual, unavoidable and normally not insurable, while the fact that this damage would normally not be insurable is precisely the reason for the mandatory additional coverage. Indeed, the French Insurance Code defines loss resulting from natural catastrophes as 'non-insurable direct material damage whose determining cause was the abnormal intensity of a natural agent...' (Art. L. 125-1 par 3). Lawyers have criticized this definition as it would appear to be confusing to call a risk uninsurable when the law then proceeds to make it insurable by compulsory coverage. The paradox disappears, however, if one realizes that compulsory insurance allows risks and functions to be sufficiently spread as a remedy to adverse selection, which may make natural disasters uninsurable. By imposing an insurance duty, the law transforms an uninsurable risk into an insurable one. Compulsory insurance may enable the private insurance market to cover harm caused by natural disasters in geographically limited areas. Floods and earthquakes are clear examples, but the French compulsory disaster insurance coverage also extends to droughts, cyclonic storms, terrorist attacks and technological catastrophes.

Insurers are only held liable to compensate damage if the government declares a certain incident a natural disaster. This is an administrative act that can also give rise to an administrative appeal. The declaration of the event as a disaster is published in the *Journal Officiel*. From the date of this publication on, the victim only has ten days to file a claim with his or her insurer. This very short time limit aims to pressure the victim to act carefully and to allow the insurer's experts to establish the extent of the damage as soon as possible. The *Code des Assurances* further stipulates that the insurer must make an offer of financial compensation within three months after the victim's claim. Moreover, the insurer must also make an advance payment within a period of two months. Agricultural damage is excluded.

The supplementary coverage for catastrophic loss is financed through an additional premium of 12 per cent on all insurance contracts covering property other than motor vehicles, and an additional premium of 6 per cent for fire and theft insurance for motorized land vehicles. The mandatory coverage is applied to all insured individuals, irrespective of whether they are actually vulnerable to natural disasters and thus exposed to the insured risk. The Law of 13 July 1982 further includes compulsory deductibles together with a prevention plan (Risk Exposure Plans, which today have become Risk Prevention Plans). These links between financial compensation and prevention have been strengthened with the aid of a sliding scale that adjusts the deductibles applying to communes that do not have Risk Prevention Plans, to encourage them to introduce such plans.

Reinsurance is provided through the *Caisse centrale de réassurance*, which is fully controlled by the French state.

There are particular features of the French system that are potentially at odds with European competition law. It has been argued that those anti-competitive effects may benefit to some extent from the efficiency defence: that is, the need to create sufficiently large risk pools and to cure the problem of adverse selection may justify the tying clause (the fact that catastrophe cover is mandatorily provided with housing insurance). Other features of the compulsory insurance scheme for catastrophic loss in France, such as fixed premiums for disaster coverage and reinsurance by the state, may benefit from a solidarity exception.

2 EXAMPLE: THE 2016 FLOODS

The year 2016 was marked by a major, atypical natural catastrophe, i.e. the flooding of the Seine and its tributaries, and of some tributaries of the Loire, in May and June. It was declared a natural catastrophe by *Arrêté du 8 juin 2016 portant reconnaissance de l'état de catastrophe naturelle*. In total, 182,000 claims were reported, costing insurers more than EUR 1.4 billion, making it the most expensive flood since 1982. The resulting cost to the CCR amounts to EUR 623 million, the second largest loss on record since the inception of the natural disaster compensation

scheme in 1982. A major portion of the impact on CCR's underwriting results, however, was offset due to a capital equalization reserves release of EUR 240 million.

The floods caused several transportation networks to be disrupted and also put into question the ability of the crisis management system to respond to an event of a higher magnitude.

B TECHNOLOGICAL DISASTERS

1 LIABILITY

Although the fault regime is still the central rule in French tort law, several strict liabilities have been developed. The French *Cour de Cassation* ruled that Article 1384, para. 1 of the Civil Code, which holds the guardian of a defective object liable for the damage caused by that object, should be considered as a general stand-alone provision, providing for a presumption of responsibility where damage is caused by objects. This article has been interpreted very broadly in French law: strict liability is imposed on the sole basis of the use, direction and control by the defendant of the object that caused the damage. In addition, there are also separate statutes laying down strict liability in various areas (e.g., strict liability for car drivers causing a road traffic accident).

In addition, there is far-reaching tort liability for public authorities under French administrative law. Public authority liability has already been accepted in France, on the occasion of the disastrous flood at Grand-Bornand on 14 July 1987, for example, which caused the death of 23 persons in addition to substantial property damage. It led to the joint liability of the state and the local government.

French law also has an interlocutory proceeding (the so-called *référé*) which allows a victim to ask a single judge to make a provisional order within a short period of time (also in non-urgent cases). This procedure is also applied to obtain provisional payment when the debt cannot be disputed. In practice, this allows a victim to obtain 80% of what may be regarded as fair compensation.

2 ACT OF 30 JULY 2003

There is another particular feature of the way in which French law deals with compensation for technological disasters, which relates to an accident that happened ten days after 9/11 (hence, on 21 September 2001) at the chemical plant called AZF owned by Total Fina Elf in Toulouse. In this event, 30 people died and 5,000 suffered personal injury, and substantial property damage was caused. Most victims obtained financial compensation through their first party insurance; others claimed compensation from the liable operator, Total Fina Elf. As property damage insurance (*multi-risques habitation*) is not mandatory, however, as we indicated

above, some victims had no first party insurance and, therefore, had to sue the operator of the plant in tort law. This was the reason for the French legislator, in the Act of 30 July 2003, to extend first party insurance coverage like the one provided by the *multi-risques habitation* to damage caused by industrial catastrophes: if an official statement has been made declaring that there is a 'situation of technical catastrophe' occurring from an '*installation classée*', causing damage to a large number of buildings, the coverage of the first party motor vehicle and housing insurance extends to risks linked to these technological catastrophes (Art.L-128-1 Code des Assurances).

It is striking that although this concerns technological (and therefore man-made) disasters, the Act does not apply to third party insurance but to property damage caused by technological disasters (except for terrorist attacks). In this case, the compulsory disaster cover is linked with voluntarily subscribed first party property insurance contracts (again, like in the case of natural disasters). All insured undergo an increase in their premiums, irrespective of whether they are exposed to a technological risk. In contrast with the Cat.Nat. regime, the legislator did not find it useful to install a premium percentage. It is remarkable that a mandatory cover for victims has been introduced in the case of a man-made technological disaster, where a liable wrongdoer can be identified. Imposing solvency guarantees on the side of the wrongdoer, such as compulsory liability insurance, could be a preferable solution.

A compensation fund has been created for uninsured victims to compensate for the consequences of technological catastrophes. This was technically done by extending the benefits of the compensation fund for victims of automobile accidents (*fonds de garantie*) through the Act of 30 July 2003 to all uninsured victims of industrial disasters (Article L.421-16 Code des Assurances), regardless of whether insurance was actually available. Compensation will be limited to EUR 100,000 so as not to incite non-insurance against the risk of damages (Article R. 421-78 Code des Assurances).

C NUCLEAR ACCIDENTS

French law on third party liability in the field of nuclear energy is derived from a combination of the Paris Convention, on the one hand, and the Brussels Supplementary Convention, on the other, which under the Constitution were directly integrated into the domestic legal system on ratification by Act No. 68-943 of 30 October 1968, as amended, on third party liability in the field of nuclear energy.

The legal regime introduced by the Paris Convention and adopted in the Act of 30 October 1968 introduced into French law the principle of strict liability on the nuclear operator regardless of fault, relieving the victim of the burden of proving

the operator's liability and making the operator strictly liable for damage to or loss of life of any person and damage to or loss of any property caused by any nuclear accident occurring in his or her installation or during transport on his or her behalf. It is relevant to state, however, that the Paris Convention does allow the operator to have a conventional right of recourse against another party to a contract if the accident was caused by an intentional act or omission, but this may not operate against the victim.

The liability of the operator is limited to:

- EUR 91,469,410 for an accident occurring in an installation (Art.4 Act No. 68-943);
- EUR 22,867,353 for transport or a low-risk installation (Art.4 Act No. 68-943).

Over and above the amount of the operator's liability, victims are compensated under the conditions and within the limits laid down by the Brussels Supplementary Convention:

- up to 175 million SDR by the state in whose territory the installation is located;
- up to 300 million SDR by the contracting parties to this Convention, including France, whose own financial contribution, under the method of calculation used, currently stands at approximately 34%.

Article 7 of the Act of 30 October 1968 requires each operator to have and maintain insurance or other financial security for an amount corresponding to his or her liability for an accident. This financial security must be approved by the Minister for Economy and Finance. Should the victims of a nuclear accident be unable to obtain financial compensation for their damage from the insurer, financial guarantor or operator, the compensation burden will shift to the state up to the amount of EUR 91,469,410 and without prejudice to any possible additional amounts.

Protocols amending the Paris and Brussels Conventions were signed in Paris on 12 February 2004. Although these protocols have yet to enter into force, their approval was authorized in France by Act No. 2006-786 of 5 July 2006. They have already been transposed into national law (Article 55 of Act No. 2006-686 of 13 June 2006 on nuclear transparency and safety, whose provisions will be applicable upon entry into force of the Protocol amending the Paris Convention) in order to bring French law into line with the new legal regime thus introduced. Once the Protocol amending the Paris Convention enters into force, the maximum liability of the operator is set at EUR 700 million for nuclear damage caused by each nuclear accident (see Art. L-597-4 Ordonnance no 2012-6 du 5 janvier 2012 modifiant les livres Ier et V du code de l'environnement).

D TERRORISM

1 PROPERTY DAMAGE

Property coverage against attacks and acts of terrorism has been compulsory for all property insurance policies since the Act of 9 September 1986. Under Article L 126-2 of the French Insurance Code, insurance contracts guaranteeing fire damage to property as well as damage to motorized land vehicles are mandatorily extended to cover direct material damage to the insured property caused by a terrorist attack or act of terrorism sustained on national territory. The repair of material damage, including decontamination costs, and the repair of non-material damage resulting from such damage are covered within the limits of the deductible and the ceiling set in the fire insurance contract. Different limits and excesses may be agreed in the case of large risks (as defined in paragraph 2 of Article L 111-6 of the Insurance Code).

The terrorist attacks and acts of terrorism referred to in the Code des Assurances are the offenses defined by Articles 421-1 and 421-2 of the French Criminal Code, which extend to acts of terrorism committed using nuclear, biological, chemical or radiological (NBCR) weapons. In addition, following the introduction of the Act of 23 January 2006, coverage also includes any material damage sustained on national territory that may result from an attack perpetrated outside its borders, such as contamination by chemical agents. Cyber-terrorism is also covered.

In 2002, the GAREAT (*Gestion de l'Assurance et de la Réassurance des Risques Attentats et Actes de Terrorisme*) reinsurance pool was created jointly by insurers, reinsurers and the *Caisse Centrale de Réassurance*. The GAREAT programme has been divided into two sections: the Large Risks section and the Small Risks section. Large risks are defined as risks for which the sums insured amount to EUR 20 million or more. The GAREAT programme is further divided into layers:

- the first layer consists of co-reinsurance between the members of the pool (EUR 500 million in annual aggregate);
- the next layers (of EUR 500 million each in annual aggregate) consist of reinsurance by international professional reinsurers up to the level at which the French state intervenes;
- the top layer (in excess of EUR 2,520 billion) consists, for the Large Risks section, of unlimited reinsurance granted by the CCR with a guarantee from the French state.

A market agreement requires insurers affiliated with the two French professional insurance bodies (FFSA and GEMA) to cede their terrorism risks systematically to GAREAT's Large Risks section. All other French or foreign insurers authorized to cover such risks may likewise join GAREAT's Large Risks section on an individual basis. CCR supplements GAREAT's Large Risks programme by providing unlimited

state-guaranteed coverage beyond the above limit. CCR receives a premium for providing unlimited state cover with a state guarantee (i.e. 10% of the annual premiums collected by insurers).

GAREAT reinsurance rates depend upon the sum insured of each risk ceded (with the exception of the premium on nuclear risks, which is 24% regardless of the sums insured). GAREAT rates apply to the property premium of the risks ceded individually to GAREAT:

- insured value between EUR 20 million and < EUR 50 million: 12% rate;
- insured value ≥ EUR 50 million: 18% rate.

The 2015 premium estimated income of GAREAT Large Risks section was EUR 200 million. This figure has remained stable for several years and reflects an average 15% rate on property policies. Private and public reinsurance accounts for around 30% of the premium, which is a significant decrease since the scheme's inception, which is due to the reinsurance market having become more competitive in this field. At the close of the underwriting year, GAREAT – being a non-funded pool – pays the residual premiums back to the members, after deduction of the cost of reinsurance, the cost of the CCR Unlimited Treaty, the claims and the management fees.

2 PERSONAL INJURY

The Guarantee Fund for victims of terrorism and other criminal acts (*Fonds de garantie des victimes des actes de terrorisme et d'autres infractions* (FGTI)) was created in 1986 to compensate for bodily harm resulting from acts of terrorism (and to provide assistance to victims of offences under ordinary law). The fund is financed by a contribution levied on property insurance policies. Articles L. 422-1 to 6 2 and R. 422-1 to 10 3 of the Insurance Code deal with the organization and financing of the FGTI.

Since its creation, French or foreign victims of terrorist acts occurring in France on or after 1 January 1985 and French victims of acts of terrorism occurring abroad can request compensation from the FGTI following a special procedure. When the authorities pass on to the FGTI information regarding the circumstances surrounding the terrorist act and the identity of the victims, the Fund's dedicated terrorist victim compensation team contacts them directly. It helps them to put together their application and aims to make funds available quickly in order to cover any initial costs. The Fund sets out a compensation proposal to victims within three months of the definitive assessment of the damage. Victims will be fully compensated for bodily harm, usually after being assessed by a doctor designated by the Guarantee Fund. If directly related to the act of terrorism, clothing expenses are also reimbursed up to a certain limit by the Guarantee Fund on presentation of supporting documents. Payments received from other sources for the same losses

(e.g., national insurance or a mutual insurance scheme) will be deducted from the financial compensation paid by the Guarantee Fund.

In 2015, the FGTI made payments totalling EUR 328.8 million to victims of terrorism and other offences. It should be noted that, contrary to Belgium, the French government pays for all damages before claiming them back from the insurers.

3 **EXAMPLE I: THE TERRORIST ATTACKS IN PARIS**

Six terrorist attacks took place in the evening and night of 13 November 2015 in Paris. In these attacks, 129 people were killed and more than 350 were wounded. President Hollande called on all Member States of the European Union to offer assistance to France. He referred to Article 42 (7) of the EU Treaty, which states that, if a Member State is attacked on its own territory, the other countries have the duty to 'provide help and assistance by all means available to them'. This was the first time in the history of the European Union for a Member State to refer to this article. On 17 November, all 28 EU Member States unanimously agreed with the request for help. The Member States were allowed to decide for themselves how they implemented the aid.

It is to be noted that the Guarantee Fund's articles state that anyone who was within a government-determined perimeter of a terrorist attack at the time of the attack may call himself a victim, even without being physically injured. The fund's clause seems to have unintentionally created a new market, as more and more people know how to find their way to the fund and claim to be victims of a terrorist attack. Indeed, among the 2,579 people who received compensation from the state-run fund, 1,218 claimed compensation for psychological injuries sustained in the attacks, 576 claimed compensation for physical injuries sustained in the attacks and 758 are family members of people who were killed in the attacks', a spokesperson for the Guarantee Fund for Victims of Terrorist and Other Criminal acts said. They received EUR 64 million. In November 2017, 947 victims out of 2,579 had been the subjects of a final compensation offer.

There is also controversy over the amounts allocated, and the operation of the FGTI is deemed 'too old and bureaucratic'. The FGTI is now engaged in improving its services and, on 26 September 2017, its Board of Directors decided to recognize 'anguish' as a form of suffering, to be compensated by a lump sum of no less than EUR 10,000.

It is expected that the November attacks in Paris will lead to claims worth EUR 350 million in the coming years. Several newspaper articles claim that the Guarantee Fund has been depleted.

4 **EXAMPLE II: THE TERRORIST ATTACKS IN NICE**

On the evening of 14 July 2016, a 19-tonne cargo truck was deliberately driven into crowds of people celebrating Bastille Day on the Promenade des Anglais in Nice, France, resulting in the deaths of 86 people and the injury of 458 others.

According to FGTI, they received 2,966 requests, and 1,609 victims had received a compensatory response by July 2017. Records of relatives and relatives of deceased persons were dealt with first, as well as those of the wounded. Nearly 98% of them have been compensated. The first compensation provisions were paid within ten days. Family members of victims who died in Nice could count on a compensation of EUR 40,000, and those who were injured were reimbursed according to the severity of their injuries. At the end of July 2017, the French government had already paid around EUR 300,000 to the Nice victims. However, there is also anger over the slow pace of victim compensation on the part of the state. Only 25 of the promised EUR 300 million were paid out to 1,610 victims. After filing an application, victims were given an advance payment of between EUR 2,500 and EUR 5,000.

E **SUMMARY**

Like most nations in the world, French society refuses to reconcile itself to the notion of fatality. Instead, the country likes to characterize itself as requiring ever greater safety and security. This requirement generates the conviction that all risks must be covered, that the repair of all damage must be quick and complete and that society must provide compensation not only for the damage it has provoked, but also for the damage that it was not able to prevent or the occurrence of which it did not foresee. The general tendency, therefore, is to extend the cover of the risks and to enable damage compensation if the probability or the extent of the risk has not been identified in time and if reparation has become necessary, by means of hybrid mechanisms (mixing insurance, liability and solidarity to various degrees). This overall tendency is summarized in the phrase ‘risk socialization’. It is, however, not really the risk that is socialized, but its harmful consequences and their compensation.

It can be noted that, if insurance is already a form of solidarity – as it leans on mutualization – risk socialization calls upon a widened solidarity beyond the circle of the co-insured, thus including national solidarity.

This attitude of France towards compensation is also clear from the way in which the financial compensation for victims of disasters has been arranged in France. With its Act of 1982, which provides comprehensive mandatory insurance for natural disasters, France is in a way a frontrunner even at the international level. The mandatory insurance scheme guarantees that all those who have housing insur-

ance (more than 90% of the population) will also be automatically insured against natural disasters. The model also provides for (state-guaranteed) reinsurance via the CCR and is regularly applied, as on the occasion of the 2016 floods.

With regard to technological disasters, France created a mandatory first-party insurance in 2003, which is at least a mandatory add-on for technological risks. With regard to nuclear damage, the compensation provided (at least via the operators' liability, as will be shown later) is low by international comparison. For terrorism, an insurance pool jointly created by insurers, reinsurers and the CCR (GAR-EAT) provides cover for property damage via a multi-layered approach with even unlimited reinsurance via the CCR with a state guarantee. Personal injury will be covered through a fund. The guarantee fund was applied to cover for the November 2015 terrorist attacks.

IV GERMANY

A NATURAL DISASTERS

1 AD HOC, EX POST COMPENSATION

The German situation with regard to financial compensation for victims of natural disasters is remarkably different in comparison with the situation in Belgium and France. The most important difference is that the damages related to natural disasters such as flooding are not covered by any mandatory insurance scheme in Germany. There is, therefore, no single instrument in Germany that deals exclusively with the financial compensation of victims of (natural) catastrophes. This basically means that potential victims, those of flooding, for example, need to rely on private insurance in Germany. The German government or specific *Länder* will intervene with *ad hoc* legislation providing financial compensation to victims of catastrophes in exceptional cases, as when the damage resulting from a catastrophe is very large. The *ad hoc* compensation based on specific statutes in Germany is qualified as ‘rather insecure, often inadequate, but sometimes “overgenerous”’.

One result of disaster insurance not being mandatory in Germany is that insurance cover is generally low. On the occasion of the ‘flood of the century’ (*Jahrhundert Flut*) of the Elbe in 2002, estimates were provided of available flooding insurance, and the number of policies with additional (flooding) cover was estimated at no more than 9%. Later studies on a flooding in 2005 also showed low amounts of insurance cover.

The German system of *ad hoc, ex post* and relatively generous compensation was heavily criticized in various studies, mainly for creating a so-called charity hazard. Charity hazard refers to the danger that incentives for potential victims to take preventive measures and to purchase private insurance may be reduced as a result of generous *ex post* compensation by the government. Empirical research comparing the mandatory public monopoly insurance in Switzerland with systems of risk transfer found in Austria and Germany also indicated that there was a substantial market failure in Germany in terms of insufficient insurance demand resulting from the charity hazard.

It is for this reason that reforms of the German system were formulated in many studies, and the most important reform proposal was to introduce mandatory comprehensive disaster insurance based on the French example. Debates took place at the political level in Germany in 2004 to introduce mandatory disaster insurance which, however, did not make it to the legislative level. Schwarze and Wagner show that political considerations played an important part in the decision-making process: ‘*Ad hoc* aid gives the decision-makers greater discretion in

their response to natural disasters than regularized benefits.' *Ad hoc* responses to disasters offer major political advantages to politicians in office.

This is a point that has been powerfully made by Depoorter, who showed that there will often be underinvestment in *ex ante* prevention and overinvestment in *ex post* recovery for the simple reason that politicians gain larger political rewards from *ex post* recovery payments than from investments in *ex ante* prevention, which will only pay off after their term in office. The case of the 2006 Elbe flood illustrates this point: 'Chancellor Schröder's energetic and sympathetic efforts to help Saxony during the floods led to the governing parties' renewed popularity, helping the social democrats to win the 2006 election.'

Another argument against introducing mandatory disaster insurance was that it would lead, at a time of economic crisis, to an estimated withdrawal of EUR 2,85 billion of purchasing power from the German economy, which were needed to stimulate economic growth. The refusal to introduce mandatory disaster insurance in Germany once more underscores the difficulty of introducing mandatory insurance, given the political rewards that can be gained through *ad hoc*, *ex post* compensation, inefficient as this may be.

2 EXAMPLE I: THE 2002 ELBE FLOOD

After the 2002 flood, a specific act (*Flutopferhilfesolidaritätsgesetz*) was created to establish a fund in order to support the victims of the catastrophe. The purpose of the fund was to give first and limited financial assistance on a primary level (*Soforthilfe*) and then to finance measures for removing the damage caused by the 2002 flood and for reconstruction efforts (*Aufbauhilfe*).

Various studies on the 2002 Elbe flood also provide information on the amount of losses and their financing. The official estimate in 2002 was that total losses resulting from the Elbe flooding would amount to approximately EUR 9.2 billion. According to Magnus, the 2002 Flood Fund disposed of a total amount of EUR 8.1 billion that was distributed through local governments.

Table 2 Financing programs in the Elbe flood

	Private Households	Residential Property	Business	Agriculture and Forestry
Emergency Relief Financing	EUR 500/person, Max. EUR 2,000/household	EUR 5,000/building	EUR 15,000 (50% of loss) and EUR 500/employee	EUR 50,000
	Municipal Infrastructure	Residential Property	Business	Agriculture and Forestry
Reconstruction Financing Assistance	90% of reconstruction costs	Max. 80% of reconstruction costs	35-75% of reconstruction costs	Max. 30% of crop losses, Max. EUR 1 million

Source: Mechler & Weichselgartner (2003), 31

3 EXAMPLE II: THE 2013 FLOODS

Following heavy early summer flooding in 2013 across much of Germany, federal and state leaders agreed on an EUR 8 billion package of assistance to help those hit hardest by the natural disaster. The federal government agreed to finance all the so-called 'reconstruction aid' upfront. The Länder then needed to pay back EUR 3.25 billion through debt retirement and interest payments over 20 years. The fund picked up the tab for up to 80 per cent of the cost of repairing the flood damage.

4 EXAMPLE III: THE 2017 SUMMER FLOODS

In the summer of 2017, the Elbe rose from a normal summer level of about two metres to 9.16 metres, well surpassing the 8.77 metre record of 1845. 'Paul' raged mainly in the northern half of Germany, especially in Hamburg, Berlin, Lower Saxony and North Rhine-Westphalia. 'Rasmund's' heavy rain fell in the last two days of June 2017 on large parts of Berlin and Brandenburg. In some parts, over 200 litres of rain fell per square metre within 24 hours. By comparison, Germany has an average of just under 800 litres per square meter in a whole year. The heavy rain alone caused damage of around EUR 60 million, mainly in Berlin and Brandenburg. The compensation for insured persons amounted to around EUR 600 million for the heavy storm series between the end of June and the beginning of July 2017. About half this amount was for damaged houses, household effects and commercial and industrial enterprises; the other half was for fully insured cars.

Following the 2017 summer floods, the German government announced hundreds of millions of euros in emergency relief to flood victims and said it was offering a package of tax breaks to ease the clean-up. The various Länder also set up compensation programmes. The state of Lower Saxony, for example, put in place an aid programme for private households to support tenants and owners in the repair of residential buildings and the renovation of household items. If the damage surpassed EUR 500, victims could receive compensation of up to 80 per cent, but insurance benefits were to be used primarily. Financial compensation was tied to

the condition that those affected should insure themselves against natural hazards in the future.

In June 2017, the conference of the Heads of the Federal States agreed to negotiate a piece of federal legislation that regulates pay-outs of governmental disaster relief aid.

B TECHNOLOGICAL DISASTERS

Germany does not have specific regulations for technological disasters. Strict liabilities, however, have been introduced via liability statutes, for example, in the Road Traffic Act (*Straßenverkehrsgesetz (StVG)*), the Air Traffic Act (*Luftverkehrsgesetz (LuftVG)*), the Environmental Liability Act (*Umwelthaftungsgesetz (UmweltHG)*) and the Gene Technology Act (*Gentechnikgesetz (GenTG)*). Catastrophic events resulting from a dangerous activity are covered, in principle, by strict liability statutes: a derailed train or a burning train in a tunnel, for example, would be subject to the operator's or keeper's strict liability.

For a variety of reasons, however, the literature holds that the strict liability statutes do not offer satisfactory protection in case of catastrophic damage. First of all, there may be catastrophic damage resulting from a technological disaster where no specific strict liability statute is applicable, for example when explosives are stored in an inhabited flat in a densely populated neighbourhood. The second problem is that there is a large possibility for an operator to call on force majeure, thus excluding liability. A third criticism relates to the fact that the special statutes introducing strict liability often only have limited amounts of compensation. As a result of financial caps, then, the full damage resulting from a technological disaster may not be compensated.

C NUCLEAR ACCIDENTS

Liability for nuclear installations is laid down in the Atomic Energy Act (*Atomgesetz*), which implements the international conventions mentioned above. The Atomic Energy Act, which aims both at promoting the use of nuclear energy and preventing damages, was passed in 1959, recast in 1985 and modified in 2002, 2011 and 2017. In addition to this act, Germany is also a party to the Paris Convention and to the Brussels Supplementary Convention, as well as to the Joint Protocol. According to the Atomic Energy Act, 'the Paris Convention shall apply as national law in the Federal Republic of Germany, unless its provisions depend on reciprocity as effected by the entry into force of the Convention' (§ 25 (1)). The provisions of the Paris Convention provide the basis for nuclear liability in Germany. They are complemented by Sections 25 – 40 of the Atomic Energy Act.

According to the Atomic Energy Act, nuclear liability in Germany has the following characteristics. As in the international regime, liability is channelled to the operators of a nuclear power plant, and the operators are strictly liable for the damage caused by a nuclear incident (§ 25 (1)). Liability is even stricter in Germany if the defences under the international regimes are no longer available, as in armed conflict, hostilities, civil war, insurrection or a grave natural disaster of an exceptional character (§ 25 (3)). However, if the damage occurs abroad, financial compensation is only due if that country provides reciprocal benefits (§ 25 (3)). The territorial restrictions under Article 2 of the Paris Convention do not apply; the operator is liable irrespective of the place of the damage (§ 25 (4)). One significant difference between the German and the international system is that an unlimited liability system is established in Germany. Only if the damage is caused by an armed conflict, hostilities, civil war, insurrection or a grave natural disaster of an exceptional character, is liability limited to the maximum amount of the government indemnification (§ 31 (1)).

To provide coverage for potential liability, the operators are required to seek financial security (§ 13 (1)). The administrative authority shall determine the type, terms and amount of the financial security, but within the limit of EUR 2.5 billion (§ 13 (2)), a limit that was established in 2002. As the maximum coverage amount of EUR 2.5 billion was not available on the insurance market, the operators of nuclear power plants sought alternatives: in 2001, the four parent companies of the 19 nuclear power plants negotiated and concluded a 'Solidarity Agreement' (*Solidarvereinbarung*), consisting of six sections and four annexes. Under this agreement, up to EUR 255.6 million nuclear liability is covered by third party liability insurance taken out by each operator. Between this amount and EUR 2.5 billion, cover is provided under the framework of a contract jointly subscribed to by all nuclear power plant operators and their parent companies. Each party has an obligation to contribute a percentage of the total amount if a damage is attributed to one of the parties. The percentage for each nuclear power station is calculated according to the square root of the thermal reactor output. The percentage of power plants is then attributed to the parent companies on the basis of their participation (Clause 1 (3)). This liability allocation system differs from that in the US, where each operator bears the same quota. In Germany, the allocation of contribution is based on the generating capacity. As in the US, the obligation to make the contribution is only due after a damage in excess of the insurance capacity has happened. However, the risk that the operators will have to contribute is even smaller in Germany: the partners only have to pay if neither the operator nor the parent company are in a position to pay up to EUR 2.5 billion (Clause 1 (5)). The solidarity agreement, therefore, is only a guarantee for payment by the liable parties.

If liability is not covered or cannot be satisfied by financial security, the Confederation shall indemnify the operator (§ 34 (1)). The maximum amount of indemnifica-

tion – to the extent that the damages are not covered by private financial security or that claims cannot be paid out of such security – is set at EUR 2.5 billion, and the payment obligation is the maximum amount minus the amount that is covered by financial security. Such indemnification is borne for up to the amount of EUR 500 million, 75% by the federal authorities and 25% by the Land in which the installation is situated. The federal state covers the amount between EUR 500 million and 2.5 billion alone. After payment of the indemnification, recourse is possible if the operator disobeys specific obligations, or if the operator caused the damage wilfully or by gross negligence, or if the operator did not seek financial security to the required extent (§ 37). Liability for third parties, however, prevails over claims for recourse (Clause 1(8)). In addition to mutually guaranteeing the liability coverage, the partners also need to provide help in handling the claims, for instance by making available legal and commercial staff capacity and infrastructure. The partners cannot ask for repayment for this kind of support. The partners also provide help for the use of independent contractors, up to the amount of EUR 122,218 million (Clause 2). To ensure the availability of assets in case of damage, the partners need to submit an auditor's certification each year (Clause 3).

German law, therefore, differs importantly from the international conventions by providing a much higher amount of compensation via a retrospective pooling scheme. The amount of financial security to be provided through the pool, moreover, does not eliminate the principal liability of the operator. The nuclear operators in Germany, in other words, are still liable if the capacity of the pool is depleted.

D TERRORISM

1 MATERIAL DAMAGE

In response to 9/11, the German reinsurance market decided to exclude losses due to an act of terrorism. The primary market followed suit in view of their missing reinsurance capacity. This then led to the creation of a so-called terrorism pool, as it did in many countries. Extremus Versicherungs-AG, a pool consisting of 17 insurers and reinsurers, was created and approved by the German state authority in September 2002. Extremus acts as a primary insurer, issuing policies on its own paper. The company buys reinsurance from its shareholders, from other companies active on the German market and from international reinsurers. The scheme is not mandatory, nor is it mandatory for insurers to offer terrorism coverage for larger risks. Primary insurers might recommend their clients to Extremus if they wish to purchase terrorism insurance.

Extremus intervenes to cover damage to property and losses due to interruption of business operations. Nuclear, biological or chemical (NBC) contamination is excluded, as well as cyber-terrorism. The scheme does not include aviation, marine, life

or personal accidents, as sums insured under life or personal accident remain relatively low. Financial compensation for victims of terrorist attacks, therefore, is not covered by Extremus. All property has to be located within Germany, and losses must occur on German territory.

Extremus is eligible for risks exceeding EUR 25 million as a consequence of a terrorist attack. This allows the primary market to provide coverage for smaller risks. Extremus covers losses over EUR 25 million, up to an overall limit of EUR 2.5 billion. All policies provide for a standard deductible of EUR 50,000. The maximum damage which a policyholder can insure with Extremus for a single year is limited to EUR 1.5 billion. Above the EUR 2.5 billion limit (in the annual aggregate co-insured by members of the pool), the German state provides an additional cover up to a further amount of EUR 10 billion to cover the excess losses. For the guarantee, the state receives a premium of 12.5% of the premiums collected by Extremus. Extremus is, in other words, a multi-layered insurance pool consisting of insurers and reinsurers providing a total capacity of EUR 10 billion. No indemnifications have been paid out by Extremus so far. The severe terrorism attack in Berlin on 19 December 2016 affected one insured (the other victims having sustained only physical injuries), but the loss remained within the deductible.

Since 1 January 2017, Extremus has been offering so-called 'threat insurance', which covering costs if, for example, a shopping centre is closed by authorities because it is presumed to be the scene of a terrorist attack.

2 PERSONAL INJURY

Victims of violent crime in Germany have the right to seek financial compensation under the Victims Compensation Law. The Act is based on the concept that victims of a violent attack have a claim for compensation against the state when the state has been unable to protect them in spite of all its efforts. Physical or mental harm as a result of a violent attack is a prerequisite for a compensation claim. Victims of crimes of violence receive all health treatment required to restore or improve their health (including, for example, health or occupational rehabilitation measures, care services, psychotherapeutic treatment etc.), payments to cover living expenses and long-term pension payments to compensate for physical injuries and economic losses. The level of the graduated pension payments is governed by the extent of the injury to health and the loss of income caused by the injury. At the lowest level, the current monthly payment is EUR 118. The only payments that will be deducted are those that the victim actually receives in respect of the same injury and which are also intended for the same purpose.

Compensation can be claimed by German nationals and foreigners who are lawfully resident in Germany.

3 EXAMPLE: THE 2016 BERLIN TERRORIST ATTACK

On 19 December 2016, a truck was deliberately driven into the Christmas market next to the Kaiser Wilhelm Memorial Church at Breitscheidplatz in Berlin, leaving 12 people dead and 56 others injured.

There was some initial confusion over the financial compensation for the victims' families: as the attacker used a truck, it was initially classified as a road incident rather than as a terrorist attack, and victims had to apply to the *Verkehrsoferhilfe*, an assistance fund set up to aid victims of road accidents. As a result, the victims of the Berlin attack were partly compensated from a fund that was set up to deal with motor vehicle accidents and not under the aegis of the Victims Compensation Law. The German Justice Minister said that the government would rewrite German law to rule out such absurdities in the future. Germany thus far (December 2017) paid out EUR 2.3 million in compensation and support. The government's hardship rules set individual sums of EUR 10,000 for immediate family members and EUR 5,000 for siblings. Those left wounded received sums based on the severity of their injuries.

The initial response to the tragic events in Berlin has been widely criticized, and its poor handling has been widely admitted, so much so that a final report on the underlying problems was presented by the German Justice Minister in December 2017. Victims and relatives, in particular, complained about the lack of state recognition, the lack of timely information and the inadequate government financial support. The report proposes that information centres for victims and relatives be established on the site of terrorist attacks, as well as a government point of contact. It also wants to streamline procedures for notifying family members of people who have been seriously injured or killed. The government, furthermore, should take the lead in advising victims and relatives on how to get support and compensation payments. Interestingly, the report's recommendations were based on general practice in Israel, a country with an extensive history of dealing with terrorist attacks.

E SUMMARY

Germany sets great store by preventing catastrophic damage, and prevention is the overriding aim of any protection against catastrophes, requiring private or public operators of installations, plants, trains, planes, sports events etc. to take extended preventive measures and precautions. These operators are required to provide reasonable preventive safety measures even against natural disasters such as flooding, storm, fire etc. Moreover, the German Federation and the Länder have established specific institutes, agencies and measures whose goal is to protect the population against catastrophic risks.

However, with regard to *ex post* financial compensation for victims, Germany does not (like Belgium and France) have a structural solution in the form of mandatory comprehensive first-party insurance. Attempts to introduce such a model failed. As a result, victims of natural disasters in Germany have to rely on *ad hoc*, *ex post* compensation. The 2013 and 2017 floods showed that the German government intervenes generously, often at the federal level, and often in combination with the *Länder*.

Germany has a strikingly interesting model for compensating damage caused by nuclear accidents. The total amount of indemnification is high, also by international comparison (EUR 2.5 billion), but it is especially striking that the major share of such compensation is paid via a risk-sharing agreement between the nuclear power plant operators. Like the Netherlands and Belgium, Germany has also created a special insurance pool to deal with terrorism-related property damage (Extremus). Personal injury is compensated on the basis of a special act dealing with financial compensation for specific victims. Despite particular problems, the German government paid out EUR 2.3 million in compensation for the victims of the 2016 Berlin terrorist attack.

V THE NETHERLANDS

A NATURAL DISASTERS

1 INTRODUCTION

Over the past decades, the Netherlands has suffered various types of natural catastrophes, such as an earthquake in southern Limburg (1992), severe storms (1997, 2002, 2007 and 2013) and heavy rain and flooding in the south-east (1993-1995). In all of those cases, the question arose as to what legal instruments could be used to provide financial compensation. Victims frequently approached the government for compensation and, as a result, the Dutch government has indeed intervened on various occasions using the public budget to provide *ad hoc* compensation to victims. As shown below, a specific Act – *Wet Tegemoetkoming Schade bij Rampen en Zware Ongevallen* (WTS) – was created in 1998 with the aim of providing financial compensation to the victims of catastrophes and severe accidents. In practice, however, it appears that the WTS has often not been applied to cases where many people suffered harm as a result of a disaster. In addition to the statutory arrangement in the WTS, therefore, the Dutch government (and other organizations) have also created *ad hoc* solutions for specific victims. The main problems relating to the insurability of disasters and collective arrangements solutions will be addressed below.

2 EVOLUTION OF INSURANCE COVERAGE

In the 1950s, Dutch insurers issued so-called binding decisions, applying to all their members, prohibiting them from insuring flood and earthquake risks (the latter being relatively small in the Netherlands with the exception of the area around southern Limburg). The insurers argued that these risks were technically not insurable and that all of their members, therefore, should refrain from covering them. They claimed that they were concerned that a natural disaster could cause billions of euros of damage and that they had too little statistical material to calculate premiums, thus fearing adverse selection. Only those who were exposed to the risk, it was argued, would have any demand for insurance; all others would have no need for coverage, leading to a situation of adverse selection. Those who did face risks of being affected by a natural disaster, consequently, were unable to take out coverage simply because insurers had agreed not to cover those risks.

As a result of an earthquake close to Roermond in 1992 and the flooding of the River Meuse in 1993, the binding decision concerning earthquakes was quickly withdrawn, and insurers came under increasing pressure to abrogate the binding decision on flooding. In part this was the result of political pressure on insurers, as shown, for instance, by questions that were put to the government during the parliamentary proceedings. But it was also due to the concerns of the European com-

petition authorities as the binding decision clearly violated the conditions of Regulation 3932/92 of 21 December 1992 on the application of Article 85(3) of the 'Treaty to certain categories of agreements, decisions and concerted practices in the insurance sector'. Levie and Cousy (1994) commented on this exemption regulation, which states that standard policy conditions in particular may not contain any systematic exclusion of specific types of risk without providing for the express possibility of including that cover by agreement (see Consideration 8 preceding the exemption of the Regulation, as well as Article 7(1)(a) of the exemption, reflecting that non-competitive practices were apparently not an exception in Dutch insurance practice). The binding decision was subsequently withdrawn in 1998.

Negotiations then took place between the government and the insurers on a new system of coverage for natural disasters, taking the French model as an important example. These debates finally led to the introduction of the WTS 1998, providing for public compensation in the event that the damage was uninsurable (as discussed below). In addition, by the end of the 1990s, Dutch insurers gave in to political pressure and announced that they were prepared to cover damage caused by heavy rain, as apparent from a letter of the Secretary of State for Internal Affairs, Gijs de Vries. An important role in this respect was played by the fact that the public funding mechanism offered under the WTS 1998 was not applicable to cases where risks would be insurable in principle. As a result, damage due to heavy rainfall became insurable.

In 1999, then, the Dutch Association of Insurers did indeed recommend that insurance against heavy rainfall be included in the existing building, fire, theft and contents covers. Damage due to rainfall, including the overflow risk of dikes and quays, should be covered for both private individuals and companies. Damage resulting from the flooding of rivers not originating in the Netherlands and saltwater flooding remains uninsurable. The WTS 1998 gives citizens and companies the right to financial compensation when insurance possibilities are exhausted.

As a side note, it is interesting to mention that, in 2002, the Dutch Association of Insurers agreed to offer agricultural water damage insurance through a pool, covering damage up to an amount of EUR 50 million, backed by a guarantee of the central government for an amount between EUR 50 and 100 million with a deductible of 25% if the damage is higher. This example makes clear that the Netherlands has been moving forward with regard to the insurability of water damage. The insurance was meant to cover crop damage due to heavy rain, in particular. The agricultural sector also agreed that, in such a case, it would not call for financial compensation from the government on an *ad hoc* basis. However, the WTS 1998 would still remain applicable, for instance in the event of damage caused by flooding. Yet, as the guarantee of the central government principally constituted state aid, the

European State Aid procedure had to be followed, as shown by the letter of the Minister for Agriculture, Cornelis Pieter Veerman of 11 April 2003.

On 15 October 2003, the European Commission approved the subsidy provided by the central government in the form of a guarantee. Then it became possible for the market to start developing these crop damage insurances, which led to the institution of two pools, called Agriver and OWM AquaPol (formerly LTO AquaPol), which both applied for the subsidy in the form of a guarantee by the central government. Since 19 March 2004, Agriver has offered crop damage insurance against the consequences of heavy rain, subsidized by a guarantee from the central government.

In 2007, crop insurance was expanded to include compensation for damage to crops in the fruit-farming sector caused by extreme frost. The European Commission approved this extension of the regulation on 19 June 2007. The regulation involves the Dutch state providing a subsidy in the form of a guarantee as a stimulus for insurance companies, ranging from EUR 6,677,400 to a maximum of EUR 20,927,400 per year for frost damage, with a total insured value of EUR 762.6 million. Furthermore, the European Commission's decision altered the state aid rules regarding the first branch of crop insurance. In both cases, a deductible of 25% per crop applies. It is noteworthy that governmental intervention thus facilitated the insurability of the risk caused by a catastrophe, especially crop damage caused by heavy rainfall and extreme frost.

This course of events makes clear that although cooperation between insurers undoubtedly has great benefits, the case of the Dutch binding decisions indicates that such cooperation may also effectively limit or even exclude coverage. Even when the binding decisions were abrogated, the negotiations between the Dutch government and the Dutch Association of Insurers set the conditions for covering damage caused by natural disasters. According to legal doctrine, this shows that there is great need of an effective competition policy in order to generate a wide and differentiated supply of insurance policies.

3 WTS 1998

In the 1990s, debate on financial compensation for victims of catastrophes, of flooding, more particularly, continued. The Dutch government originally argued against the French solution as it feared that free consumer choice would be limited and that this compulsory system would lead to increased costs for citizens. Nevertheless, the government apparently considered these problems as less important, introducing a draft largely like the French framework: a fund was to be installed, financed through a tax on housing insurance, and all those insured (bad or good risks) would have to pay this tax. The Dutch Council of State, however, issued a negative advice on this draft, stating that it would be preferable to have the govern-

ment finance this risk and that it would be possible to insure flooding risk. Thereupon, the government decided to withdraw the draft.

In the next phase, the Belgian example of the 1976 Disaster Fund became the model for the WTS, an Act on compensation of damage due to catastrophes and large accidents. The goal of the WTS was to offer a more structural solution to financial compensation of victims of catastrophes instead rather than *ad hoc* responses. According to its explanatory memorandum, the WTS foresaw in a 'structural arrangement on the basis of which the State gives compensation to those who made costs in preventing or limiting damage and to those who suffered damage which is the immediate and directive consequence of a freshwater flood, an earthquake of another catastrophe of at least equal order'. De Vries (1998), de Groot (2004) and Bruggeman (2010) analysed in detail how the WTS provides a right to financial compensation for damage and specified the main compensation principles: it is applicable in the case of freshwater flooding or earthquakes that are considered a catastrophe, or a large accident of at least equal order. The latter only falls within the scope of application of the WTS if it has been so declared by Royal Decree (Art.3). The parliamentary proceedings make clear that such an accident at least requires that many governmental organizations and services of various disciplines must have intervened in a coordinated way and that the accident has endangered the health of many persons and caused substantial damage.

The WTS clearly has a subsidiary character, as is made clear in the Act itself. Article 4, for instance, provides that the victim will receive financial compensation for particular types of damage, including damage to a dwelling, commercial loss and property damage, while Article 4(3) of the WTS stipulates that the victim is not entitled to financial compensation when the damage was reasonably insurable or when the victim was able to obtain compensation from another source. The parliamentary proceedings make clear that damage is considered to be reasonably insurable when it is not generally excluded from coverage and when it is generally insurable without limiting conditions or excessively high costs. This gives rise to the question in what respect damage resulting from natural disasters can be considered insurable. It is explicitly noted, therefore, that damage to motor vehicles, for example, will not be compensated through the WTS as this type of damage is insurable and is covered under commercial insurance. The WTS may be applicable, however, if insurance were theoretically possible but victims did not take out a policy because the premium charged would not be proportional to the coverage provided.

The WTS works with a layered system of compensation. The general basis for compensation is laid down in Article 6 of the Act, but the Implementing Regulation of the WTS contains more specific rules for calculating the magnitude of certain damages and costs. If the WTS is directly applicable or declared applicable to a specific

disaster by Royal Decree, a Ministerial Regulation will need to be elaborated. This Ministerial Regulation then lays down more detailed rules regarding the compensatory amount and the calculation methods. Instead of full financial compensation, the victim will only receive a contribution towards the total amount of his or her damage and costs. In practice, the available amount per disaster or large accident is limited to almost EUR 500 million.

In practice, the WTS mainly applies to damage caused by heavy rain. De Groot (2004, 152) claims that in its six years of existence (and even in its 13 years now), the WTS has been applied only four times. The first two times, its application concerned cases of heavy rain. As the heavy rain in both these instances did not pertain to a formal flood in the sense of Article 1 of the WTS, the WTS needed to be declared applicable by Royal Decree. It is remarkable, of course, that this statutory arrangement, which was specifically created by the legislator to compensate victims of catastrophes, was applied in the case of mere damage due to heavy rainfall which is in principle insurable, and the legislator has not succeeded in its (at least implicit) attempt to create an exclusive arrangement for government contributions in the event of natural catastrophes. It is not surprising, therefore, that the WTS has been criticized in the literature (see below).

4 RECENT EVOLUTIONS

When the absence of adequate flooding insurance in the Netherlands was criticized by the Netherlands Scientific Council for Government Policy (WRR), the Dutch insurers came up with a proposal for a flooding insurance scheme based on the French model. This time, however, they encountered difficulties with the Netherlands Authority for Consumers and Markets (*Autoriteit Consument en Markt* (ACM)). The ACM criticized the fact that consumers would no longer have a choice and even doubted whether there was any social need for disaster insurance. The ACM argued that consumer interest groups, for instance, would not support a flooding insurance scheme. As a result, the insurers withdrew their initiative in 2013 and held that a political solution would have to be found. In their press memo, the insurers noted: 'As a result of the position of the ACM, the Netherlands will still be without an affordable flooding insurance with an adequate cover. On the occasion of the next flooding (which will inevitably take place), victims will again be uncompensated. They will then have to wait and see whether they can still call on the WTS. And they will rightly ask why no arrangements have been made.'

It is striking that, despite long negotiations and many attempts, this situation has not changed today (2017 - early 2018), and flooding insurance is still not available in the Netherlands. This reluctance to seek insurance solutions was also apparent in the Dutch reaction to the Green Paper on the insurance of natural and man-made disasters. In the Dutch reaction, the government claimed it was against European

regulations aiming to increase the insurability of natural disasters. The government was only in favour of increasing possibilities for obtaining insurance against natural disasters, but at the same time it resisted greater government involvement (arguing that this would lead to moral hazard), mandatory disaster insurance (as this would lead to negative redistribution) and the French model of a mandatory add-on in addition to voluntarily purchased insurances.

This overview of the development of disaster insurance in the Netherlands shows that attempts have been undertaken to develop flooding insurance in the Netherlands at various times, but that these attempts have all failed for a variety of reasons. Although the binding decisions from the 1950s have formally been abrogated, it would seem that the spirit of these binding decisions has not yet left the Netherlands. Even though the binding decisions were abrogated and the WTS was created after pressure from the European Competition Authorities and after serious flooding in the 1990s, the reality is that it is still impossible to obtain flooding insurance in the Netherlands in the year 2018. For victims of natural disasters, this effectively means that they will have to wait and see whether the government will declare the WTS applicable or, if it does not, whether the government will still provide *ad hoc* compensation outside of the WTS framework. Regardless of many reports and recommendations that were made, also by the WRR, flooding insurance in the Netherlands is still not available 60 years after the dramatic flooding that took place in the province of Zeeland in 1953.

B TECHNOLOGICAL DISASTERS

1 INTRODUCTION

In the Civil Code, the Netherlands includes – in addition to the negligence rule based on Article 6:162 of the Civil Code – a large number of strict liabilities. There are, for example, strict liabilities for damage caused as a result of dangerous substances and waste sites (Article 6:175 of the Civil Code). These strict liabilities are not linked to any compulsory liability insurance, but if the liable injurer has purchased liability insurance, the victim has a direct right of action against this liability insurer.

In theory, the liabilities from Title 6.3 of the Civil Code can be applied in case of a technological (man-made) disaster. In practice, however, the question that often arises is not so much whether the legal technical conditions for liability have been fulfilled, but rather whether the injurer will be able to effectively provide compensation. Insured amounts are often insufficient.

2 SOLVENCY GUARANTEES?

The Netherlands does not have many mandatory solvency guarantees provided for in legislation. The Belgian example of compulsory insurance in combination with

strict liability for explosions and fire in public buildings has also been discussed in the Netherlands. A Belgian scholar, Van Schoubroeck, even maintained that if a disaster like the Volendam fire had taken place in Belgium, the damage would have been largely covered under the mandatory insurance cover.

3 **WTS**

When discussing the financial compensation for victims of natural disasters in the Netherlands above, we already discussed the existence of the WTS 1998. The idea of the legislator was to create an arrangement that would provide exclusive compensation in the case of large disasters, i.e. both natural and man-made catastrophes. For man-made catastrophes, the WTS should be declared applicable by Royal Decree.

A condition of Article 4(3) WTS, however, is that damage should not be recoverable from another source. Practice has shown that, as a result, the WTS may not be applicable in cases of man-made disasters where, in principle, damage can be claimed from a liable injurer. The subsidiarity of the WTS, therefore, manifests itself in two circumstances: either the WTS is applicable, but certain types of damage are recoverable from another source and hence not covered under the WTS; or the WTS is not applicable at all, given the claiming possibilities in tort law.

In order to provide a good picture of the problems facing victims of technological disasters, we will outline two major technological catastrophes that occurred at the beginning of this century to illustrate the problems involved in providing financial compensation to victims of technological disasters in the Netherlands. Precisely in cases of serious man-made disasters with large personal injury, as in the cases of Volendam and Enschede, the WTS was not applied. The formal reason provided for non-application was that the damage in both cases concerned 'insurable damage', in which case the WTS was inapplicable.

4 **'ENSCHEDÉ'**

The first example is the explosion of a fireworks factory in Enschede on 13 May 2000, which took place after a fire in the fireworks factory of S.A. Fireworks. As a result, 23 people lost their lives and 950 people were injured and a whole neighbourhood was more or less extinguished. The damage amounted to at least several hundred millions of euros. The question, of course, arises how this damage was compensated in practice. A claim could and was filed against the liable company based on tort law. It became immediately clear, however, that this corporation was able to compensate the damage to a limited extent only: the total amount of insurance available to cover the total amount of the damage was hardly worth mentioning. A claim in tort, therefore, would never lead to financial compensation of the victims. Therefore, the question was asked again whether other mechanisms could be used to compensate the victims.

The catastrophe in Enschede is interesting because it shows very clearly the limited scope of the very Act that should provide financial compensation to victims of catastrophes: the WTS 1998. This Act was not declared applicable to the catastrophe in Enschede for the simple reason, the government argued, that it mostly concerned insurable damage. As far as victims were concerned, one could of course think of various first party insurances that have or could have covered the victims' losses; as far as corporate damage was concerned, various corporate insurances might have covered the losses. However, although the WTS 1998 was declared non-applicable, the government argued that, as far as the damage was not insured, victims could receive some financial compensation through a National Catastrophes Fund (*Stichting Nationaal Rampenfonds* (NRF)). This fund is an interesting construction: it is a private initiative and, therefore, a privately-run fund, to which the government donates funds with considerable generosity.

In this specific case, the community of Enschede provided first aid and paid funeral costs and other related costs. For victims who were not (sufficiently) insured, the community received a contribution from the NRF. After the disaster, the community of Enschede created the so-called Commission for the Financial Settlement of the Fireworks Disaster (*Commissie Financiële Afwikkeling Vuurwerkramp* (CFA)). On this Commission, there were representatives from the community, the provincial government, the insurers and the NRF. The central government only acted as an 'observer'. The task of the CFA was to make an inventory of the damage and to determine to what extent some victims were not or were underinsured. The CFA then had to formulate proposals for additional financial compensation for the community of Enschede, and it proposed various arrangements for non-insured damage, which were also largely implemented. As far as the damage of individual citizens was concerned, they dealt with compensation for lost furniture, compensation for damaged cars that were not insured and compensation for specific costs relating to the unusual circumstances. All these heads of damage were compensated through the NRF. The central government made a lump sum payment of 6.2 million Guilders to the fund (around EUR 2.8 million).

A specific fund was created to make advance payments and provide loans to companies. The NRF, therefore, provided for citizens but not for companies. In November 2001, an arrangement for companies established specifically for damage caused by the fireworks catastrophe, consisting of

- a compensation for non-insured and underinsured material damage (60% of the value with a 10% deductible);
- a compensation for non-insured and underinsured commercial losses (70% of the lost profits compared to 1999 with a deductible of 30%), on the condition that the company's assets were lower than EUR 225,000;

- a compensation in case of company shutdown, with a maximum of three times its annual profit in 1999 on the condition that the company's own assets were lower than EUR 225,000;
- a maximum compensation of EUR 2,500 for legal, fiscal and accountancy assistance.

This consisted of an amount totalling approximately 90,000,000 Guilders (around EUR 40.8 million) which was paid by the Ministry of Economic Affairs to a foundation called Financial Aid Fireworks Catastrophe (*Financiële Hulpverlening Vuurwerkcramp*). The government estimated that, with this aid, more than 90% of the companies concerned in the disaster area would be able to carry on their business in an acceptable manner.

5 'VOLENDAM'

Relatively shortly after the events in Enschede, the Netherlands faced yet another major catastrophe: on New Year's Eve, between 31 December 2000 and 1 January 2001, a large fire broke out in a café De Hemel in Volendam. Many young victims died, and many suffered serious injuries as a result of the fire. In this case, too, the question of adequate financial compensation and the role of the government was raised. A major difference with the fireworks explosion in Enschede was that the damage in Volendam was mainly restricted to personal injury, whereas there was also large property damage and there were economic losses in Enschede, in addition to personal injury.

As in the Enschede case, the possibilities of using tort law were examined, in addition to social security payments to victims. Although the café owner was the primary individual responsible, the victims would also look to other potential defendants, given – once again – the insolvency problem. As the owner only had relatively limited insurance coverage, the victims would probably seek recovery from other sources too. After all, there were no adequate fire escapes and various regulations were violated and permits had not been obtained. Barendrecht showed that the Volendam case is typically one in which multiple tortfeasors have acted together and have all contributed to the risk. He, therefore, suggests that a division of liability should take place in such cases based on contributions of each of the tortfeasors (and victims!) to the risk.

Formal law suits against public authorities did not take place and, in the end, a group of victims reached an agreement with the café's owner, Mr. Veerman. With the help of the Volendam community, a settlement was reached whereby Veerman decided to sell his café, which was then purchased by the community. The sum Volendam received for the real estate was then made available for victim relief through a fund.

Other forms of support were also discussed on the occasion of this disaster. As the WTS 1998 was once again declared not applicable because this was insurable damage, the government donated an amount of 3.5 million Guilders (around EUR 1.6 million) shortly after the disaster to two foundations that took care of victims with serious burns: the Dutch Burns Foundation (*Nederlandse Brandwondenstichting*) and the Victims of New Year's Eve Fire Foundation (*Stichting Slachtoffers Nieuwjaarsbrand*). This payment was explicitly made as a gesture of national solidarity with the victims and not as recognition of any kind of government liability. In addition, substantial amounts were paid by the central government as well, relating, for instance, to compensation of costs made by the Edam-Volendam community, compensation of costs for a specific research committee that examined the causes of the disaster and to compensate other costs.

A Committee formulated several advice papers dealing with the financial compensation that should be provided to the Volendam victims by the central government. Those guidelines were also followed in practice. These papers made many comparisons with the arrangement for the victims of the fireworks factory explosion in Enschede. It was suggested to provide an amount of EUR 150,000 to the Volendam victims, whereas the amount provided to the Enschede victims had only been EUR 120,000. The Committee's arguments were that many young victims were involved in the Volendam case, with the incident damaging their future perspectives; the severity of the burns would involve a very long and slow recovery process for many of them. On the basis of these proposals, the central government made a total amount of EUR 30.1 million available for the victims. This is remarkable as the central government's initial idea was merely to provide compensation of direct costs, but eventually large amounts of *ad hoc* compensation were apparently provided as well.

6 LESSONS FROM ENSCHEDE AND VOLENDAM

A common feature of the Enschede and Volendam catastrophes was that no mandatory solvency guarantees were available. The operator of the fireworks factory in Enschede had only a voluntary liability insurance covering several millions of guilders, and the same applied for the operator of the Café in Volendam, Mr. Veerman. This then led to a second common feature in both cases, with the Dutch government providing generous financial compensation: in the case of Enschede, 90 million guilders (around EUR 40.8 million) was paid by the state; in the case of Volendam, 50 million guilders (around EUR 22.7 million) was approximately paid by the Dutch state (the taxpayers).

7 CRITICISM OF THE WTS

It is remarkable that the statutory arrangement laid down in the WTS, which was specifically created by the legislator to compensate victims of catastrophes, has been applied only in the case of damage due to heavy rainfall but not in the case of

serious man-made disasters causing major personal injuries, such as the aforementioned fireworks accident in Enschede in 2000 and the Volendam fire in 2000-2001. The legislator, therefore, has not succeeded in its (at least implicit) attempt to create an exclusive arrangement for government contributions in the event of both natural and man-made catastrophes.

It is not surprising, therefore, that the WTS has been criticized in the literature. The first criticism relates to the fact that the government intervenes with specific funding for victims of catastrophes on an *ad hoc* basis. This preference for victims of catastrophes compared to victims of other accidents has been criticized from the angle of the equality principle. Second, legal doctrine also holds that, if specific financial compensation needs to be provided to victims of catastrophes, it is more desirable to have a structural solution rather than *ad hoc* arrangements. The WTS 1998, which does not meet this requirement, would have to be revised in this respect. Third, it has been stressed that there might be reasons for increasing duties of potential tortfeasors to guarantee their solvency. Fourth, it seems logical to increase the possibilities of first party insurance, too.

To some extent, these four points of criticism of the WTS and, in fact, of the financial compensation for victims of disasters in the Netherlands generally are strongly related. The first criticism of *ad hoc* compensation is, of course, related to the second implying that a structural solution clearly specifying the rules of the game *ex ante* would be better. The third criticism relates specifically to technological or man-made disasters: to the extent that a tortfeasor can be identified, such as the operator of a specific plant, imposing solvency guarantees would have the double benefit of guaranteeing more adequate compensation for victims, on the one hand, while guaranteeing better prevention by controlling the moral hazard by liability insurers, on the other. Whereas the third criticism relates specifically to technological disasters, the fourth criticism, relating to the lack of first party cover, of course relates to natural disasters. In cases where tort law can be applied, such as technological disasters, it makes sense first to apply liability rules and compulsory financial security in order to correctly allocate the social costs of disasters.

If such a cost allocation to tortfeasors is impossible, as with natural disasters, it would be logical to work out a comprehensive mandatory first party insurance scheme, as has been done in France and Belgium. Such a structural first party insurance scheme for natural disasters, then, offers precisely the structural solution that is required by the second point of criticism while avoiding the necessity of *ad hoc* compensation that is addressed in the first point of criticism. The same applies to the third point of criticism as well: to the extent that adequate strict liability rules are put in place, combined with mandatory solvency guarantees, financial compensation for victims of technological disasters will also be available. This also avoids *ad hoc* compensation while providing the desired structural solution.

Now that the prohibited cartel agreements not to cover the consequences of large-scale flooding and earthquakes have been withdrawn, insurance policies covering those risks could be brought to the market, provided that some kind of solution for large losses is available through reinsurance and/or the government, which is as yet only the case for damage due to heavy rainfall and frost. One should note, however, that commercial insurance cover is available for other relevant natural hazard risks in the Netherlands, such as storms, lightning and hail.

8 REFORMS

The Dutch government has installed a body with the specific task of assessing the WTS 1998: the Commission for Compensation in Cases of Catastrophes and Incidents (*Commissie Tegemoetkoming bij Rampen en Calamiteiten* (CTRC)). It was asked in 2001 to advise the government on optimal compensation in the event of catastrophes, examining first the existing possibilities of compensation and then formulating proposals for desirable additional compensation. Its final report, *Solidarity with Policy (Solidariteit met Beleid)*, was presented to the Minister of the Interior on 7 March 2005 and consists of three parts: a general section and two research reports on the financial settlement of disasters in the Netherlands and the financial compensation schemes for damage caused by catastrophes in some other countries. The CTRC made many interesting suggestions regarding financial compensation for victims of catastrophes in the Netherlands, including the following:

- Tort law needs to be the primary mechanism for compensating catastrophic damage.
- Judicial liability procedures are to be shortened and simplified by means of the new act on the collective settlement of mass damage.
- Insolvency guarantees for injurers need to be introduced or increased.
- For catastrophes where no liable injurer can be identified, the CTRC suggests increased use of first party insurance. The proposal is designed not to make the purchase of disaster coverage mandatory as in France, but to facilitate the insurability of risks by allowing the state to act as reinsurer, on the one hand, and by pursuing an active information policy, on the other.
- Change the WTS into a national solidarity fund that, on the basis of clear rules and structures, provides various types of compensation, including compensation for uninsurable damage.

Most of these proposals of the Commission are in line with what has been suggested in legal doctrine. On 5 June 2006, the former Minister of the Interior, J.W. Remkes, wrote a letter to parliament outlining the government's position on the CTRC's reform proposals. In this letter, Remkes noted the government's desire to achieve some fundamental changes:

- A provision of guarantees or insurance should be made compulsory in cases where a liable injurer can be identified;

- Insurance coverage by potential victims has to be stimulated in instances where a liable injurer cannot be identified; and
- The current legislative basis for compensation of victims of catastrophes has to be changed to address the current *ad hoc* solutions.

A summary of these proposals can be found in Faure and Hartlief ((2006), 341-342) and Bruggeman ((2010), 390-393).

The government, therefore, strongly suggested the development of voluntary first party insurance, without prescribing a straightforward duty for potential victims to purchase insurance coverage as in the French model. If insufficient capacity makes the risk hard to insure, the state could act as reinsurer. The general idea behind this new policy is that there would be less pressure on the public budget, and that responsibility would be shifted either to the industry for so-called technological disasters or to potential victims for natural catastrophes.

The Scientific Council for Government Policy (WRR), furthermore, published a report in 2012, in which it argued that it is important to provide incentives to all stakeholders involved to prevent disasters. The report stressed the need for creating structural solutions to possible damage, but also to create effective incentives to control risks, prevent incidents and mitigate damages. The WRR rightly argued that many companies are not intrinsically motivated to take responsibility with a view to preventing incidents. Therefore, the WRR (again after the CTRC) recommended that solvency guarantees should be introduced for potential injurers.

The message of the CTRC and the WRR, therefore, is similar: financial compensation offered by the insurance market today is too low, and without government intervention, insufficient amounts will be available. For this reason, both reports point at the important role not only of the government but also of insurers in providing adequate compensation.

The current situation in the Netherlands, however, means that the bill for technological disasters is paid by the taxpayer rather than by liable injurers and their liability insurers, as the Volendam and Enschede cases so painfully illustrate.

C NUCLEAR ACCIDENTS

The Netherlands ratified the 1960 Paris Convention and the 1963 Brussels Convention on 28 September 1979 by the Act of 17 March 1979. The 1979 Act came into effect on 28 December 1979, bringing both conventions into force in the Netherlands on that date. On that same date, the Nuclear Incidents (Third Party Liability) Act of 1979, laying down the regulations governing nuclear third party liability in the Netherlands, also came into force. On 1 August 1991, an Act amend-

ing the 1979 Nuclear Incidents (Third Party Liability) Act came into effect, implementing the Paris and Brussels Protocols. Simultaneously, another Act amending the 1979 Act on Third Party Liability in implementation of the Joint Protocol was passed by Parliament. This act came into effect on 27 April 1992. Furthermore, on 30 October 2008 Parliament approved a bill to ratify the 2004 Protocols to the Paris Convention and to the Brussels Supplementary Convention and a bill to amend the Nuclear Incidents (Third Party Liability) Act.

The limitations on the scope of the Paris Convention do not apply to the liability of an operator of a nuclear installation on Dutch territory, for damage: (a) suffered on the territory of a state party to the Convention wherever the incident occurred; (b) suffered on the territory of a state not party to the Paris Convention, but party to the Joint Protocol, as a result of an incident in the territory of a state party to the Joint Protocol; or (c) wherever suffered, as a result of an accident on Dutch territory (Art. 15(1)). In addition the operator is not exonerated from paying financial compensation for damage caused by an incident due directly to a grave natural disaster (Art.3).

The maximum liability of the operator under the Paris Convention has been raised to EUR 1.2 billion (Art.5(1)). Under Article 5(3), a lower amount may be set by ministerial order for low-risk installations. If, in the opinion of the Minister for Finance, an operator of a nuclear installation cannot obtain the financial security required by the Paris Convention or if such financial security is only available at an unreasonable cost, the minister may enter into contracts as insurer on behalf of the state or provide other state guarantees up to the operator's liability limit. In so far as the funds available from the operator's financial security are insufficient to compensate for the damage, the state shall make available funds up to the operator's maximum liability. In such cases, the minister is entitled to exercise the operator's rights of recourse (Art. 10).

If the amount of damage caused by a nuclear incident on Dutch territory exceeds the limit of the Brussels Convention, the government will make available supplementary funds up to a maximum total of EUR 2.27 billion (Art. 18(1)). Under Article 18(4), these public funds will also be made available for damage suffered in the territory of parties to the Brussels Convention on condition of reciprocity.

D TERRORISM

1 MATERIAL DAMAGE

The Dutch government and the Dutch Association of Insurers agreed to set up a dedicated reinsurance company, called the Dutch Terrorism Risk Reinsurance Company (*Nederlandse Herverzekeringsmaatschappij voor Terrorismeschaden N.V.* (NHT)), to cover insurance against terrorist acts in all classes of business. This step

represented an intervention measure to address a market failure to supply terrorism risk coverage.

Since 1 July 2003, more than 185 insurance companies (95% of all active Dutch insurers), the government and some reinsurance companies have participated in the NHT. Every insurance company that does business in the Netherlands and that is permitted to do so can become a member of the NHT (with the exception of insurance companies providing nuclear cover). The participating insurance companies cede all their terrorism exposure to the NHT pool, which acts as a reinsurance company. The pool then assumes 100% of the terrorism liability for all individual and SME insurance policies. The NHT provides coverage for non-life insurance (for property located in the Netherlands), life insurance (for policyholders with regular residence in the Netherlands), healthcare insurance and funeral insurance.

The NHT will provide reinsurance coverage for terrorism, malevolent contamination or precautionary measures or any conduct in preparation for terrorism. The NHT decides whether or not a particular event should be considered the consequence of a terrorism risk. Terrorism is defined as ‘any violent act and/or conduct – committed outside the scope of one of the six forms of acts of war as referred to in Article 3:38 of the Financial Supervision Act (*Wet op het Financieel Toezicht*) – in the form of an attack or a series of attacks connected together in time and intention as a result whereof injury and/or impairment of health, whether resulting in death or not, and/or loss of or damage to property arises or any economic interest is otherwise impaired, in which case it is likely that said attack or series – whether or not in any organizational context – has been planned and/or carried out with a view to effect certain political and/or religious and/or ideological purposes.’

The overall capacity of the terrorism risk reinsurance pool is limited to 1 billion per calendar year. In the event of a severe terrorist attack, the limit of EUR 1 billion a year may not be sufficient, and the compensation for all members will be decreased in that case. There are four layers of coverage:

- EUR 300 million in the aggregate (pooled cover provided by the primary insurers);
- EUR 100 million in the aggregate in excess of the EUR 300 million provided by international reinsurers;
- EUR 550 million in the aggregate in excess of the EUR 400 million provided by international reinsurers;
- EUR 50 million in annual aggregate in excess of EUR 950 million provided by the Dutch government.

The first layer applies a so-called threshold deductible, meaning that insurers bear the risk to EUR 7.5 million. The deductible does not apply to life insurance or health insurance.

On an annual basis, the members pay their share of the reinsurance premium and the operational cost of the NHT. The individual share is a proportional figure of the market share (gross premium income) of a member company. The Dutch government charges a premium at a level intended to price itself out of the market when terrorism risk insurability is restored. From the period of 1 July 2003 until 31 December 2003, the government charged a premium of EUR 10 million (EUR 20 million on an annual basis). A system of descending premiums is used for increasing coverage; the first part of coverage, for example, is relatively expensive as coverage of EUR 100 million requires the same premium as the next increment of EUR 200 million. An incentive has been incorporated into the system, therefore, to stimulate the recovery of commercial insurance: if individual reinsurers are capable of covering the risk, expectations are that they would offer coverage at a lower premium. This approach appears to pay off as a commercial reinsurer declared itself willing to cover the first EUR 100 million of governmental coverage (between EUR 700 and 800 million), delaying governmental intervention until the EUR 200 million threshold.

As in the other European countries, in sum, the NHT is a private enterprise in which a large number of insurance companies participate with a multi-layered approach. The main advantage of this model is that a total pool capacity up to EUR 1 billion can be provided. A strong point is also that a risk premium is charged by the government, which has stimulated insurers to develop alternatives themselves. Some have criticized the NHT, arguing that the state should not intervene to provide reinsurance and that it would have been better to provide this structural solution by applying the WTS 1998 to terrorism risk as well.

Given the recent terrorist attacks in Europe, there are currently discussions about the aggregate limit of the NHT, specifically about whether the current limit is sufficient.

2 PERSONAL INJURY

Apart from the NHT, the Compensation Fund for Victims of Violent Crime (*Schadefonds Geweldmisdrijven*) was institutionalized as early as 1976, offering a payment to everyone who has suffered injuries or serious material and immaterial losses due to an intentional violent crime committed on Dutch territory. The Compensation Fund is a supplementary compensation mechanism, meaning that it only awards financial compensation if the victim clearly cannot be reimbursed in any other way. The Fund, which is financed through the general public budget, therefore, acts as a safety net.

E SUMMARY

According to the general Dutch perspective, financial compensation to victims of natural catastrophes and man-made disasters should be provided through general the state budget. This point of view is evidenced by Article 21 of the Dutch Constitution, which enforces a duty on the government to take care of ‘the habitability of the land’. The consequences of this duty lead to the principle of mutual solidarity amongst the Dutch population.

This has also been reflected in the Dutch developments regarding financial compensation for victims of disasters. Of all countries studied above, the Netherlands is probably the one where most of legal doctrine, expert reports and policy documents have been devoted to this topic, without providing a structural legislative solution. As a result, despite exposure to many different natural disasters ranging from earthquakes to heavy rains and floods, there is no structural solution to guarantee financial compensation for victims of natural disasters in the Netherlands today.

The Act (WTS 1998) that was supposed to serve this goal has not been able to provide adequate compensation to victims and has for that reason been subject to much criticism and many reform proposals, which have not led to any legislative change as yet. The inadequacy of the WTS 1998 was especially shown on the occasions of an explosion in a fireworks factory in Enschede and a fire in a café in Volendam (both in 2000). In both cases, the WTS 1998 could not be applied, but generous compensation was paid by the Dutch state. A major problem in both cases, however, was that compulsory financial guarantees did not apply and that the operators’ liability insurance did not provide sufficient compensation.

It is not surprising, therefore, that reform proposals have recommended mandatory financial security by operators. With regard to cover for terrorism, the Netherlands has been one of the first countries to develop a terrorism risk insurance pool (NHT), providing a total cover of EUR 1 billion via a multi-layered approach with reduced intervention by the Dutch state.

VI A CRITICAL COMPARISON

A STARTING-POINTS AND METHODOLOGY

In the introduction, we made clear that this comparative exercise was undertaken specially to see where the Belgian, French and German legislation on financial compensation for victims of disasters deviates from the situation in the Netherlands. In this section, we will provide a critical comparison of the situation in the four countries.

In order to undertake this comparison, we will take the economic starting-points that we formulated as a baseline in the introduction. From an economic perspective, these six starting-points had to be followed in order 1) to guarantee adequate financial compensation for victims *ex post* and 2) to provide effective incentives for disaster risk reduction *ex ante*. These principles will constitute the background for the comparison that we will undertake in this section. In doing so, we will follow the same order and address the same types of catastrophes as we did throughout the study. We will look, therefore, at the regulation of natural disasters (B), technological disasters (C), nuclear accidents (D) and terrorism (E).

An important limitation of our study is that we did not attempt to provide full details on all aspects of those disasters in each country. We could obtain information on the activities to which compulsory financial guarantees apply for some countries, but not for all. This limitation on the scope of the research inevitably also limits the scope of the comparison. Still, we believe that it provides a fairly good opportunity to sketch the adequacy of financial compensation in the countries studied with respect to the four specific types of disasters, taking into account the need for adequate *ex post* compensation and providing *ex ante* incentives for disaster risk reduction.

The benchmarks for our comparison are the adequacy of financial compensation for victims and the effectiveness of incentives for disaster risk reduction. Obviously, other benchmarks could be used as well, and we alluded to those in this report to some extent. For example, a country such as Belgium developed specific compensation mechanisms that aimed to achieve not only adequate compensation for victims, but also speedy compensation. Speed may be an important criterion to judge the adequacy of the financial compensation mechanism for the simple reason that the length of the procedure could increase the victims' suffering and non-pecuniary losses. A lengthy procedure could lead to secondary losses and to bankruptcies, for example, because victims' livelihoods and, therefore, their source of income have been destroyed. The lack of speedy compensation could make the losses even larger in those cases.

It is for this reason that we addressed mechanisms in legal systems that aim at the victims' speedy compensation in some cases (especially when referring to technological disasters). However, we did not have full information arrangements in all four legal systems we examined, and, therefore, we will not use this as a specific proxy in our comparison. The reader should, however, be aware that the speed of providing financial compensation can be an important element both in judging the adequacy of the compensation for victims and in assessing the effectiveness of the incentives for disaster risk reduction. It may also be clear that the longer the procedure takes, the more the *ex ante* incentives for disaster risk reduction might be diluted. So we do recognize that speed is of importance in financial compensation, therefore, both in the adequacy of the financial compensation and in the effectiveness of the incentives for disaster risk reduction.

In the introduction, we also made clear that we do not distinguish between the several heads of damages as this would make our study needlessly complex. Particularly with terrorism, but also with some other catastrophes, however, we noticed that there is a difference in the compensation mechanisms dealing with property damage (material losses), on the one hand, and with personal injury, on the other, where there is some kind of paradox at work: personal injury affects people's imagination more strongly, which is why compensation mechanisms will often provide generous compensation for personal injury at a relatively low threshold. The focus may not be directly on property damage, although arrangements to cover property damage have also been developed in many countries, as the overview showed, especially for terrorism. The paradox is that, although public attention and compensation mechanisms may strongly focus on personal injury, the largest losses are often related to property damage rather than to personal injury. The specific consequences of these differences will also remain undiscussed in this comparison.

To go beyond a country comparison for the specific disasters, we will also undertake to provide a more general view of how the particular countries are doing with regard to providing financial compensation to victims of disasters. To do so, we will use the methodology developed by Jordan, Würzel and Zito. To judge the adequacy of the use of new instruments for environmental governance in a number of countries, they have developed a methodology to qualify particular countries as 'leaders, followers and laggards'. Although our field of research obviously differs from theirs, we believe that their methodology provides an interesting integrated perspective for assessing the adequacy of the financial compensation of victims of disasters in specific countries (F). We also ask the question whether it is possible to find explanations for some of the differences we observed (G), and we analyse to what extent the existing frameworks were able to deal with some of the recent disasters (H). Finally, we speculate on whether important reforms are to be expected in the domains we examined (I).

B NATURAL DISASTERS

In the introduction, we mentioned that *ad hoc, ex post* government compensation will not provide effective *ex ante* incentives for prevention. We also mentioned that insurance is better able to provide those *ex ante* incentives and we also mentioned that the supply of catastrophe cover could be stimulated by the government acting as reinsurer of last resort. How are these three particular requirements followed in the four countries under discussion with regard to financial compensation for victims of natural disasters?

Addressing the first aspect, i.e. the provision of *ad hoc, ex post* compensation, which would negatively affect incentives, the situation in Belgium is complex: there was a Disaster Fund, but this was structural rather than *ad hoc*. This Disaster Fund, moreover, did not provide full compensation, as a result of which the negative effects on *ex ante* disaster risk reduction were probably not that problematic. Since the statutes of 2003 and 2005, the role of the Disaster Fund has been reduced even further. Belgium has now moved to a system of mandatory insurance; the Disaster Fund only intervenes if mandatory insurance does not apply and only if the disaster has been recognized as such by the government. In France, there is no *ad hoc, ex post* compensation as cover is provided through mandatory insurance. In Germany, generous *ex post* compensation is provided from the public purse, as the example of compensation after the flood of the century illustrated. The situation in the Netherlands is rather peculiar as a specific statute (the WTS 1998) is meant to provide structural *ex post* compensation for victims of disasters but does not apply to natural disasters that can be considered 'insurable'. It has been applied to cases of heavy rain. This brief overview demonstrates that the French system comes out best, as mandatory insurance in fact avoids depleting the public purse.

This introduces the second aspect: whether there is comprehensive mandatory insurance cover for natural disasters. This was not the case in Belgium, but as a result of legislative interventions in 2003 and 2005, there now is comprehensive mandatory insurance, at least for those natural disasters that fall within the scope of the statute. Belgium followed the French model, where an Act of 1982 introduced mandatory additional cover in addition to voluntary housing insurance. Germany tried to introduce a similar model in 2004, but it was rejected for political reasons. The same is the case in the Netherlands: despite many attempts and recommendations by a variety of commissions, there is as yet no mandatory cover for natural disasters; even the mere availability of voluntary insurance for natural disasters such as flooding, to which the Netherlands is prone, is still problematic. Again, France comes out best, immediately followed by Belgium, which followed the French example.

Looking at the third aspect, i.e. whether the government plays a role as reinsurer of last resort in order to stimulate the supply of catastrophe insurance, our comparison turns out largely the same as for mandatory insurance: the current Belgian Regional Disaster Funds still intervene for amounts of damage that exceed the upper limit of mandatory insurance cover. This is similar to the French model, where the *Caisse Centrale de Réassurance* (CCR) provides unlimited reinsurance, *de facto* financed by the French state.

There is a difference, though, between the two models: in Belgium, the (structural) Disaster Fund intervenes for amounts higher than the insurance limit. This intervention does not appear to be incentive-based. In the French CCR model, state intervention for amounts exceeding compensation provided by insurers is not directed to victims, but to the CCR and indirectly to the insurers. In this sense, it could be argued that the French model still stimulates the insurability of natural disasters by facilitating the supply of catastrophe cover. However, the intervention of the CCR has also been criticized for basically providing reinsurance for free and, therefore, for not being market-based either. It is doubtful, therefore, whether there are major differences between the Belgian and French models of state intervention for amounts beyond the amounts provided by insurance cover.

As there is no mandatory insurance mechanism for natural disasters in Germany or the Netherlands, these countries do not have a particular role for the government to play as reinsurer of last resort in this particular domain. Again, France comes out best, followed by Belgium.

C TECHNOLOGICAL DISASTERS

The requirements for adequate financial compensation of victims of technological disasters are rather different for the simple reason that, in these particular cases, there is a potential injurer who can be held liable to compensate the damage. National legislation, therefore, should try to provide effective incentives for disaster risk reduction to that particular operator.

There are, however, particular aspects in the design of liability rules which are important in allowing liability rules to have their incentive effect. Given that operators usually have better information on the optimal technologies for preventing technological disasters than the judge, and given the difficulties for potential victims to prove a fault, a strict liability rule would provide better incentives than a fault-based or negligence regime. However, liability rules can only function effectively if guarantees are provided that the injurer will have money to compensate the victims. As technological disasters may easily cause damages whose magnitude is substantially higher than the injurer's wealth, it is important to introduce guarantees against this insolvency risk.

Finally, access to justice for potential victims may be problematic, particularly in cases involving a large number of victims. This could lead to procedural difficulties and long delays in deciding the tort case. This is not only problematic from the perspective of victim compensation, with victims having to wait for damages for many years, but also from the perspective of incentives, with tortfeasors possibly being out of business when they are forced to compensate many years after the incident, thus potentially diluting the incentive effect of liability rules. It may be important, therefore, to have systems in place allowing rapid compensation of victims in the case of technological disasters.

With regard to the first aspect, strict liability, there do not appear to be substantial differences between the countries examined. All systems have introduced strict liabilities for technological disasters to a lesser or greater extent. In some cases, this is based on an extensive interpretation of old tort law provisions in civil codes; in other cases, special statutes have introduced strict liabilities. Some of those strict liabilities were the result of the implementation of international treaties, such as for marine oil pollution or nuclear accidents, or even European Directives, such as those for product liability and environmental liability. There is, therefore, an unsurprisingly large convergence between the systems.

Many legal systems, moreover, have accompanied the introduction of strict liabilities with mandatory solvency guarantees. Although the limited scope of this study did not allow us to examine the full extent of solvency guarantees, there are a few striking differences. Belgium and France appear to have a relatively large number of activities to which solvency guarantees apply. In the Netherlands, there appears to be a general reluctance to introduce mandatory solvency guarantees. The dramatic cases of Enschede and Volendam are typical in this respect: there were serious insolvency problems precisely because the limited amount of voluntary insurance purchased by the operators was insufficient to cover the damage. It is not surprising, therefore, that the many reform committees that investigated financial compensation for victims of technological disasters all recommended introducing or increasing mandatory solvency guarantees.

Some legal systems also have specific procedures allowing rapid compensation for victims of technological disasters. One of the more recent statutory changes is probably the Belgian legislation of 2011, which offers possibilities for victims to obtain low-threshold speedy compensation based on a pre-payment by insurance companies. France has a rather peculiar Act of 2003, which introduced mandatory insurance for technological disasters, but, remarkably, not liability but first party insurance to be financed by victims. From the perspective of effective prevention incentives to operators, it is remarkable that the French legislator opted for a mandatory first party construction in the case of technological disasters rather than for mandatory solvency guarantees for operators. This, therefore, appears to be an

example that is not in line with the general starting-points mentioned in the introduction. Germany and the Netherlands also have specific procedures allowing victims to claim a limited amount of damages, but these procedures are rather general provisions in procedural law and are not specifically geared towards victims of technological disasters like in Belgium and France.

D NUCLEAR ACCIDENTS

When discussing nuclear accidents in Belgium, the general framework was discussed in a detailed manner. It was made clear that most of the international nuclear liability conventions are based on strict liability, but that there is a limited liability of the operator, and, in addition to the operator's liability, mandatory financial security and financial compensation to be financed by the state and by all contracting parties.

These features of the international nuclear liability regime have been critically reviewed in the economic literature. The strict liability and the mandatory solvency guarantees are obviously viewed as positives as they may lead to optimal *ex ante* incentives for disaster risk reduction. However, the limitation on liability is problematic because this may insufficiently expose operators to liability and could lead to undercompensation of victims. It is also problematic that the state rather than the operator provides a substantial amount of compensation as this *de facto* amounts to a subsidy for the nuclear industry.

Although all countries have based their system on the same international conventions, there are important differences between the countries we examined, as has also been made clear in overviews provided by the OECD's Nuclear Energy Agency. These differences could relate to: 1) the total amount of financial compensation available to victims; 2) the question whether the operator is sufficiently exposed to liability and 3) whether it is the state rather than the operators who provide the compensation. These differences have been summarized in Table 3:

Table 3 Nuclear operator's third party liability amounts and financial security limits

Country	Operator's liability amount	Funds available		
		Financial security limit to cover operator's liability amount	Public funds	International funds (established under either the bsc or the csc)
Belgium	EUR 1.2 billion	EUR 1.2 billion		SDR 125 million
France	EUR 700 million	EUR 700 million	After depletion of the operator's liability amount up to SDR 175 million	SDR 125 million
Germany	Unlimited	EUR 2.5 billion	EUR 2.5 billion	SDR 125 million
The Netherlands	EUR 1.2 billion	EUR 1.2 billion	After depletion of the operator's liability amount up to EUR 2.3 billion	SDR 125 million

If we look at this Table, several questions mentioned above can be answered. First, addressing the matter of the total funds available, there appear to be some similarities and some differences. German law is most generous as it has a financial security available of up to EUR 2.5 billion. Belgium and the Netherlands are similar in that they have a financial security limit for the operator of EUR 1.2 billion and in addition international funds of up to SDR 125 million. After the depletion of the operator's liability, the Netherlands also has public funds available of up to EUR 2.3 billion. The country that has the most nuclear power plants in Europe, France, is strikingly the least generous, only having a limit for the operator of EUR 700 million, public funds of SDR 175 million and international funds of 125 million.

It is clear anyway that even the 'best' country does not have sufficient funds available to cover the costs of an average nuclear accident. Looking at not only estimates of the costs of nuclear accidents, but also at the real costs, more particularly those of the Fukushima incident, it is clear that they amount to USD 80 billion and more, clearly showing that there is serious undercompensation of victims.

Related to this is obviously the question whether the operator is fully exposed to liability. Again, the situation is probably worse in France, where the operator, Electricité de France (EDF), is exposed to the lowest amount of EUR 700 million. Belgium and the Netherlands already do a lot better with an operator liability of EUR 1.2 billion and a financial security to be provided for the same amount. But the 'best' is undoubtedly Germany, which not only has the principal position of having unlimited operator liability, but also of financial security of up to EUR 2.5 billion.

The results, therefore, are the same when we consider the question whether it is the operator or the state that takes financial responsibility: Germany comes out

best, with at least EUR 2.5 billion being financed by operators; France comes out worst, with only EUR 700 million being financed by the operator; Belgium and the Netherlands are in between, with EUR 1.2 billion being financed by the operator. In the Netherlands, however, public funds of up to EUR 2.3 billion are made available after depletion of the operator's liability. Note that, in comparison, Germany makes an amount available of EUR 2.5 billion, which is paid by the operators.

E TERRORISM

With regard to terrorism, there are fewer between the countries as they all have installed multi-layered systems, including intervention by the state as reinsurer. However, although all countries in this study have pool constructions, there are substantial differences between the countries with respect to the total amounts available and financing. Belgium and the Netherlands both have pool constructions for a total of EUR 1 billion. The French GAREAT system provides a total of EUR 2,520 billion. However, France does not have a limit. The highest layer, consisting of 'unlimited protection', is provided by the CCR and backed up by a guarantee provided by the French state. Germany provides a total amount of EUR 10 billion.

There are also substantial differences as to where the division between insurers/reinsurers and the state is concerned. Here the Netherlands does remarkably well as only EUR 50 million of the total limit of EUR 1 billion is paid by the state. Germany is at the other extreme with EUR 7.5 billion of the total of EUR 10 billion being compensated by the state. In Belgium, EUR 300 million of the total of EUR 1 billion is paid by the state, and in France the CCR again provides unlimited reinsurance in excess of the amount of EUR 2,520 billion.

F LEADERS, FOLLOWERS AND LAGGARDS

If one attempted to summarize the previous comparison using the framework of Würzel, Zito and Jordan, this would provide the following picture:

Table 4 Leaders, followers and laggards

Disaster compensation mechanism		Leader	Follower	Laggard
Natural disasters	<i>Ad hoc</i>	France	Belgium	Netherlands, Germany
	First party insurance	France	Belgium	Netherlands, Germany
	Government or market	France	Belgium	Netherlands, Germany
Nuclear	Amount	Germany	Belgium, Netherlands	France
	Operator exposed	Germany	Belgium, Netherlands	France
	Government subsidy	Germany	Belgium	France, Netherlands
Terrorism	Amount	France	Germany	Netherlands, Belgium
	Market or state	Netherlands, Germany	Belgium	France

Source: Adapted from Wurzel, Zito and Jordan (2013) with updates

To be clear: when referring to the leader here, we usually took the country that does best in terms of the financial mechanism and in view of the economic principles. When referring to the laggard, we took the country that does worst. The followers were always in the middle, but not necessarily countries that followed examples from others.

The Table can also be briefly explained: with regard to natural disasters, France comes out best on all accounts as it has mandatory first party insurance. In principle, there is no *ad hoc, ex post* government compensation and, therefore, no government intervention either. Belgium has followed the French model and is considered a follower, therefore, on all accounts. The Netherlands and Germany are the same in the sense that they do not have mandatory first party insurance cover but still largely rely on *ad hoc, ex post* compensation and, therefore, on government intervention.

With regard to nuclear accidents, Germany comes out best on all accounts: the total amounts of compensation are very high, nuclear operators are exposed to unlimited liability and there is a mandatory provision of EUR 2.5 billion. The risk of state subsidy in Germany, therefore, is relatively reduced. Belgium and the Netherlands can be considered followers regarding the total amounts, which are comparable. However, the subsidy aspect is more problematic in the Netherlands than in Belgium as public funds up to an amount of EUR 2.3 billion are still made available in the Netherlands after depletion of the operator's liability of EUR 1.2 billion, which is not the case in Belgium. For nuclear risk, France does worst on all accounts: operators are exposed to liability of EUR 700 million, the lowest figure in all countries reviewed, and there is insufficient exposure, therefore, of the operator to liability. There is also a compensation via public funds and, therefore, a subsidy

effect. The total amount of financial compensation for nuclear risk in France is also low.

For terrorism, as far as the total amounts are concerned, France comes out best as, in principle, there is unlimited provision of funds via the CCR. Germany is next with a EUR 10 billion amount. The amounts are substantially less in Belgium and the Netherlands (both EUR 1 billion), and hence they were qualified as laggards. When we ask ourselves whether it is the market or the state that provides the amount, however, the Netherlands comes out best: of the total amount of EUR 1 billion, only EUR 50 million is provided by the state, and the Dutch state, moreover, charges a premium for this intervention. State intervention in Belgium is relatively limited: EUR 300 million out of a total of EUR 1 billion. State intervention in France, of course, is huge as it provides unlimited cover via the CCR. In Germany, a last layer of EUR 7.5 billion in compensation is provided by the state. A premium of 12.5% of the premiums collected by Extremus has to be paid to the state for this guarantee. It is positive, therefore, that this layer provided by the state does not consist of a mere subsidy.

There is in fact no country that comes out best on all accounts: France may rank high for financial compensation for victims of natural disasters and Germany for nuclear incidents. But France does quite badly in nuclear accidents, and Belgium usually ends up in the middle. It is striking, however, that the Netherlands ends up as a laggard in many cases, except for providing a limited government subsidy for terrorism risk compensation, for which it also charges a premium.

G EXPLAINING THE DIFFERENCES?

The methodology we just applied allows us to give some indication of the leaders, followers and laggards. Indeed, the overview we provided, analysing the financial compensation of victims of disasters in the four countries, also showed remarkable differences. Of course, it would be interesting to go beyond this comparison and to ask the question whether explanations can be provided for the different attitudes in the various countries.

It is striking that some countries, such as France, are very quick to introduce mandatory comprehensive insurance for natural disasters, whereas others, such as Germany and the Netherlands, are more reluctant to go down that path. It is also striking that, following certain disasters such as Fukushima, some countries are very quick to respond and adapt compensation amounts for victims of nuclear accidents (as Germany did), whereas others are much slower or do not respond at all (as France did). One can only speculate about the sources of those differences.

To some extent this may be related to differences in compensation culture in the various countries we have examined. In the summary of each country, therefore, we have already provided some more general observations on how victimization is viewed in that particular country and whether the country relies rather on individual autonomy or on solidarity. However, we do not have the possibility to examine potential sources of these differences based on diverging legal cultures.

Some indications in this respect, however, have been provided in the literature. In an interesting study, Van Dam has used Hofstede's framework for analysing cultural differences to explain the cultural differences between the tort law systems in Europe. Using Hofstede's criteria for explaining cultural differences (such as power distance, uncertainty avoidance, individualism versus collectivism and masculinity versus femininity), Van Dam explains that in the United Kingdom, for example, individualism ranks higher than in France or Germany, where collectivism is more important. This, according to him, helps to explain certain differences between the features of tort law in these three countries. It would certainly be interesting to analyse whether such an analysis based on cultural differences could explain some of the attitudinal differences we have observed in this study.

However, the differences we observed might not be directly related to preferential or cultural differences. It is well-known that industrial pressure groups play an important role in shaping legislation in general and tort law in particular. In other words: powerful interest groups, particularly those related to industry, may play an important role in shaping legislation on the financial compensation of victims of catastrophes. This may explain why there is opposition against a more widespread use of obligations for operators to show financial security in some countries, such as the Netherlands.

Politicians clearly have their own preferences as well. Recall that politicians often stand to gain from providing *ex post* compensation to victims of disasters. This may explain why politicians oppose the introduction of structural solutions (such as mandatory compulsory insurance) in some countries, such as Germany, as this would remove their possibility of making political gains from awarding *ad hoc* financial compensation to victims. As the German case study showed, political resistance explained why a proposal to introduce mandatory insurance for natural disasters was not accepted in Germany. Some differences observed between the legal systems, therefore, are not only related to different compensation cultures, but also to lobbying efforts by interest groups and to considerations of self-interest by politicians.

H RECENT EVOLUTIONS

We started this study by referring to an earlier study from 2006, which had reviewed compensation systems in the four countries and which we largely took as a basis for our case studies. However, we also indicated that, since that period, a lot has happened: not only have further (proposals for) legislative changes taken place, but the countries examined have also been hit by many disasters. In fact, with the exception of nuclear accidents, all the other disasters we scrutinized (natural, technological and terrorist ones) have hit one or more of the countries we examined. This is why we also examined to what extent the compensation mechanisms put in place were used to compensate the victims.

In this respect, it is striking that in various ways – and causing more criticism in some countries than in others – financial compensation has been provided to the victims. In some cases, it was done on the basis of existing legislation; in other cases, new legislation was created or *ad hoc* interventions were made to provide compensation. Belgium could apply its Terrorism Act of 1 April 2007 and its TRIP pool solution to the terrorist attack on Brussels airport. France could apply its mandatory insurance scheme for natural disasters (with reinsurance via the CCR) to cover the losses related to the 2016 flooding, and it could use the compensation mechanism for personal injury to compensate the victims of the terrorist attacks in both Paris and Nice. The same was true in Germany, where government compensation was provided to deal with personal injury claims by the victims of the 2016 Berlin terrorist attack. As Germany has no structural solution, both the 2013 and the 2017 floods were compensated on an *ad hoc* basis.

This could lead us to conclude, therefore, that all countries dealt with the victims' financial losses, also in those recent disasters, in one way or another. It should obviously not lead us to conclude, however, that the compensation regimes in the countries we examined are, therefore, adequate. In many cases, in Germany in particular, compensation speed and adequacy were criticized. Moreover, as we made clear, providing adequate compensation to victims is only one criterion for judging a financial compensation system; the other criterion is to what extent the compensation mechanism provides effective incentives for *ex ante* disaster risk reduction. In this respect, there are still remarkable differences between the countries, and politicians generally still appear to be showing a strong tendency to provide compensation in no matter what way when there is significant public pressure.

I LOOKING INTO THE FUTURE

Another interesting question is if this critical comparison of the countries provides any indication of how countries would deal with disasters in the future. Observations in this regard are largely speculative, of course, but based on what

has happened in the past, a few speculations could be made. It is unlikely that major changes will take place in France and Belgium in the short run because structural solutions have been put in place and are generally considered to be satisfactory. Germany attempted to introduce compulsory disaster insurance, but the attempt failed. It is not very likely that a similar attempt will be undertaken again in the near future.

In the Netherlands, financial compensation for victims of natural disasters has led to many stakeholder debates, policy documents and reports, but not yet to any concrete legislative reform proposal. However, it is likely that, as a result of climate change, amongst other things, the Netherlands will be more vulnerable to particular natural disasters, especially those related to water, such as sea level rise, heavy rainfall and flooding. It is not unlikely that, if another one of those hits the Netherlands in the future, the question will be asked once more why insurance cover for those risks is still largely unavailable in the Netherlands and why the Netherlands should not be able to introduce a structural solution similar to that in Belgium and France.

With regard to technological disasters, major changes are unlikely to occur in Belgium and France in the short run. In the Netherlands, it is likely that the current lack of compulsory financial securities for operators of hazardous activities will be open to re-examination. There may be strong political opposition against increased duties in this respect, but the current externalization of harm to society by operators is most likely to be felt as unacceptable, even more so if another large technological disaster should occur.

The area where the influence of the major interest groups (licensees of nuclear power plants and electricity producers) has generally been great is undoubtedly related to liability for nuclear accidents. The nuclear lobby been able to create very favourable conventions with low limits on liability. After Chernobyl, it took more than 10 years to adapt the international conventions, and, more than 30 years after Chernobyl, most of those adapted conventions and protocols have not yet entered into force. The international arena, and the OECD's Nuclear Energy Agency in particular, does not even have serious proposals on the table to reform the international conventions to accommodate the externalities caused by nuclear risk, even post-Fukushima. Given the apparently complete capturing of the NEA by the nuclear lobby, not much is expected to change in the international arena in the near future.

This may be different, however, at the national level. With higher amounts of compensation (compared to the nuclear conventions) and reduction of state subsidies, Germany proved to be quite progressive even before Fukushima. Interestingly, this led to the creation of a risk-sharing agreement between the nuclear

power plant operators in Germany. Not surprisingly, the country in Europe that is lagging behind in this respect is exactly the one where 50% of all Europe's nuclear plants are located: France. It has the lowest liability levels for nuclear operators and high levels of state intervention. At the national level, however, one may generally expect Member States to follow the German example. This implies that, as a result of public pressure and green lobbyism, some countries may decide to deviate from the international regime, which is largely favourable to the nuclear industry. They may decide, for example, to raise limits on liability or even, following the German example, to introduce unlimited liability.

Terrorism is a domain where not many changes are to be expected in the near future. After 9/11, all four legal systems already put in place terrorism pools to deal with terrorism-related property damage. With regard to personal injury, most countries we examined already had compensation funds in place for victims of violent acts which could also benefit victims of terrorism. The recent attacks in France, Germany and Belgium, moreover, have shown that the systems that had been put in place were actually able to provide adequate compensation to victims. It is not very likely, therefore, that major changes are to be expected in this domain in the near future.

VII FINAL THOUGHTS

We undertook this exercise to examine whether, from the Dutch perspective, there are possibilities to improve the current financial compensation system for victims of disasters. We explored, therefore, whether higher amounts of compensation can be provided and whether the system can be restructured to provide effective incentives for disaster risk reduction.

An interesting lesson we can draw from the critical comparison in the previous section is that there is a lot of scope for mutual learning between countries. There are indeed substantial differences, relating to varying approaches not only between countries but also between different domains. It was also striking to see that there is not one country that, in view of our economic starting-points, is doing perfect in all respects. France may be doing well with regard to the financial compensation for victims of natural disasters, but certainly not in the area of nuclear risk. However, it was also striking that the Netherlands appears to be lagging behind its neighbouring countries in many domains. This, therefore, means that there is large scope for improvement and learning for the Netherlands.

In fact, as we have clearly indicated when discussing the Dutch case, there have already been many studies that came to the same conclusions as this report on necessary system reforms in the Netherlands. They can easily be summarized as follows: in the domain of natural disasters, there is a strong case to be made for the Netherlands to follow the French/Belgian example and to introduce comprehensive mandatory insurance for certain natural disasters, particularly for flooding. In the domain of technological disasters, the dramatic cases of Volendam and Enschede clearly showed that the Netherlands should make much more use of mandatory solvency guarantees. This has already been recommended in previous reports, also by the WRR, and it is also our conclusion in this study.

The reason why efficient solutions are not introduced is often related to politics and more particularly to the effectiveness of interest group lobbying and the lack of political rewards. Depoorter (2006) showed convincingly that politicians receive too little reward for investments in *ex ante* prevention and that they largely benefit from *ex post* compensation. This is why there will often be systematic underinvestment in *ex ante* disaster risk reduction and overcompensation *ex post*. That this is not merely a theoretical issue was well demonstrated by the German attempt to introduce comprehensive mandatory insurance for natural disasters in Germany, but where politicians did not want to lose the opportunity of reaping political rewards from providing *ex post* compensation and did not want to expose households to premium payments in times of financial crisis. Despite these political hurdles, which have undoubtedly played an important role in the Netherlands

too, it remains important to point out the dangers and weaknesses of the current system: insufficient compensation will be available when yet another flood or Enschede/Volendam-type of technological disaster occurs; and there is systematic underinvestment in *ex ante* disaster risk reduction.

One problem when facing catastrophes is that some will argue that, when disaster strikes, the damage will be so huge anyway that it is impossible to provide any type of *ex ante* compensation mechanism that would reasonably be able to deal with catastrophe. Ultimately, it will be the government and, therefore, the taxpayer that has to pay. This fallacy is often used to justify complete lack of action in finding a structural solution for financial compensation mechanisms for victims of disasters. The argument is wrong for the obvious reason that disasters come in different degrees, and that not all disasters are of such magnitude that it is impossible to provide compensation through market solutions such as insurance. Even if the actual damage of a catastrophe exceeds insurable amounts, moreover, a structural solution of EUR 10-20 billion in compensation, for instance, would still have the benefit of lowering the additional financing that would be required.

The most important point here is that the fatalistic perspective ('there is nothing we can do anyway') also reduces disaster preparedness and effective investment in disaster risk reduction. It remains important, therefore, to develop a structural solution even if one is aware that this solution will adequately deal with some but not necessarily with the most dramatic disasters. The experience with the French/Belgian model for dealing with natural disasters, using market insurance and intervention by the state as reinsurer of last resort, shows that it is possible to develop a structural solution that is able to deal with most if not all natural disasters.

An major limit of our study, of course, is that we addressed only four types of disasters: natural, technological, nuclear and terrorist ones. We did not pay any attention to specific types of technological disasters that could potentially lead to catastrophic losses, such as a major failure of energy systems, independent from or related to cyberattacks or, more generally, the huge economic losses and social disruptions that could follow from cyberattacks. As we already made clear in the introduction, cyberattacks show particular idiosyncrasies which make them different from any of the catastrophes we have discussed so far. Moreover, as we also made clear, not every cyberattack is necessarily a disaster, although it could be in financial terms. Some of the mechanisms, such as insurance, that were put in place to deal with the disasters that we have discussed in this report are also available to deal with cyberattacks. Alternatives such as the risk-sharing agreements used in the nuclear sector in Germany, moreover, have also been proposed recently as a potential remedy for cyber-security risks.

A major difference between the disasters that have been studied in this report and cyberattacks is that the losses resulting from cyberattacks have not yet been catastrophic, which does not mean that this could not potentially be the case. The question also arises whether a cyberattack necessarily leads to demands for financial compensation. What makes cyber security risks different is that they involve demands for information sharing, for risk reduction and for damage mitigation, which often require collaboration but not necessarily the type of financial compensation for the types of disasters we have studied in this report. Cyber security risks, therefore, should undoubtedly be the subject of further research in another study.

The principles and solutions developed in this report could be relevant to other catastrophe management areas. The major lesson from this and many other studies devoted to this topic is always clear: developing structural *ex ante* solutions for dealing with financial compensation after a disaster has occurred is always better than *ad hoc, ex post* solutions. The old saying remains true: prevention is always better than cure.

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